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SEPTEMBER, 1948

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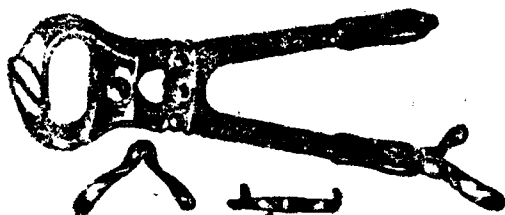
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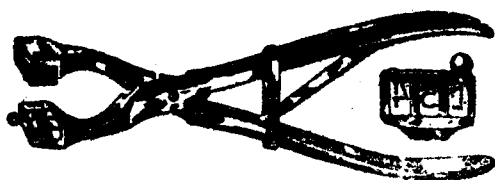
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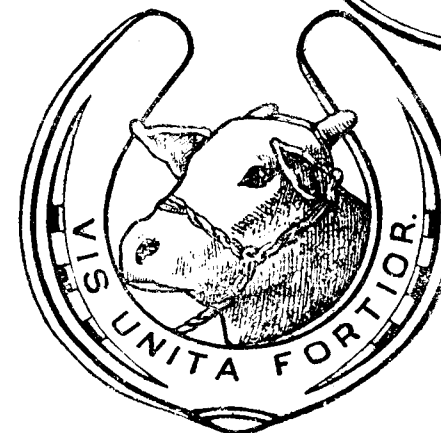
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THE
INDIAN VETERINARY JOURNAL

(The Journal of the All-India Veterinary Association)



Editor :

P. SRINIVASA RAO, G.M.V.C.

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NOTICE

The Indian Veterinary Journal

A Bi-monthly Record of Veterinary Medicine and Surgery
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PUBLISHED FOR THE ALL-INDIA VETERINARY ASSOCIATION

EDITOR :

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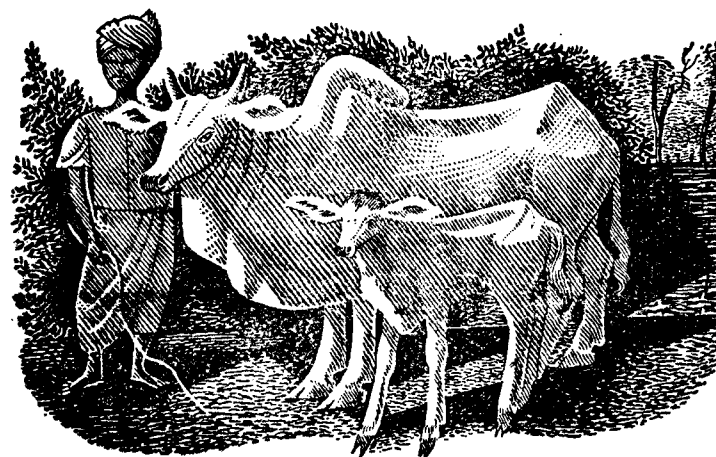
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Independence-Day Message to the Nation

By

H. E. the Governor-General Sri C. RAJAGOPALACHARIAR

On August 15, 1948, we reach the end of one year of Independence. Our misfortunes have been great and unexpected. We can trace the causes now, but it is a different thing to be wise beforehand. There is no doubt that our Government and our people have had to face what they had not been prepared for. That our Government and our national leaders have not done badly is the opinion of competent international observers who have not spoken to flatter. It is through severe trials that a nation's fibre is strengthened. Otherwise, a people cannot progress.

The greatest of our misfortunes is the passing away of Gandhiji at a time when his wise and inspiring guidance was most necessary. This misfortune has compelled us, those who have been left behind, to fall back on our own light. Gandhiji brought the precepts of all the scriptures into the plane of dynamic wordly action and removed the distinction between the teachings of religion and wisdom in the affairs of the world. If we isolate his teaching from our daily activities as individuals or as a State and pay reverent worship to his memory and his word without making it give direction to our activities in the way he desired, erecting a wall between politics and the virtues and restraints which he preached, then, indeed, our worship would be an empty hypocrisy.

Let us in conducting our affairs, try on each occasion of doubt, or difficulty to think as he would have thought if we had gone to him for advice. And let us act as if he were still among us and watching.

A long struggle, such as we have gone through has a tendency to leave behind a certain inelasticity of mind and hesitation in tapping all resources which the context requires. We must learn to think constructively and to pool all talent and resources for the national work before us.

The first thing is to avoid the vanity of hatred for, indeed, there is nothing more than vanity in hatred and in the plans that follow from it, as we can see if only we read past history to purpose, and not for mere entertainment.

The next thing to realise is that to be independent is only an opportunity, and it is only integrity in public life and industry in constructive work that can build and, making up for lost time, bring out the potential greatness of our country.

The Motherland expects every one now to go full steam ahead in all work. She wants the maximum civic spirit and co-operation.

Independence-Day Message to the Nation

By

The Hon. Pandit JAWAHARLAL NEHRU, Prime Minister of India

The 15th August came and we rejoiced at our achievement in spite of the pain of partition. We looked forward to the sun of freedom and the opportunity that freedom brings. But though the sun rose it was hidden from us by dark clouds, and for us it remained a twilight hour. It has been a long twilight and the brightness of the day is still to come. For freedom is not a mere matter of political decision or new Constitutions, not even a matter of what is more important, that is, economic policy. It is of the mind and heart and if the mind narrows itself and is befogged and the heart is full of bitterness and hatred, then freedom is absent.

Another August, 15th has come and it is a solemn day for us in spite of all that has happened. The year has considerable achievement to its credit and we have gone forward some distance along our journey. But the year is also full of unhappiness and humiliation and of a betrayal of the spirit that has been the redeeming feature of India. This year has seen the triumph of evil in the assassination of the Father of the Nation, and what greater shame and sorrow could there have been for anyone of us than this.

We celebrate this solemn day as we should, but our celebration cannot be one of vain glory and pious platitudes. It must be one of heart-searching and a fresh dedication to our cause. Let us think not so much of what we have done but of what we have left undone and what we have done wrongly. Let us think of the millions of refugees who, deprived of all they possessed, are still homeless wanderers. Let us think of the masses of India who continue to suffer and who have looked to us with hope and waited patiently for a betterment of their unhappy lot. Let us think also of the mighty resources of India which, if harnessed and utilised for the common good, can change the face of India and make her great and prosperous. To this great task let us address ourselves with all the strength in us. But above all let us remember the great lessons that Mahatma Gandhi taught us and the ideals that he held aloft for us. If we forget those lessons and ideals we betray our cause and our country.

So on this anniversary of our Independence we dedicate ourselves anew to the great cause of free India and her people. May we prove worthy.—JAI HIND.

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General Articles

B.C.G. VACCINATION—ITS VALUE—IN THE CONTROL OF HUMAN AND BOVINE TUBERCULOSIS

By

V. R. RAJAGOPALAN, G.M.V.C., DIP. BACT. (Manchester)

Indian Veterinary Research Institute, Mukteswar.

Calmette and Guérin (1924) of the Pasteur Institute, Paris, announced a method of vaccination of cattle against tuberculosis with an attenuated strain of bovine tubercle bacilli. This strain came to be called, after the authors, Bacillus of Calmette and Guérin or B.C.G. This strain was derived from a virulent strain of tubercle bacillus of the bovine type by successive cultivation on glycerinated bile medium transplanting for 4 years every 15 days and, then upon a bile-potato medium, until, after 13 years, it lost its virulence for all species of animals.

Cultures of B.C.G. are usually maintained by 15 day passages on potato-soaked in veal-infusion-broth with three successive reversions, after every tenth passage, on to potato-soaked in bile-glycerine-broth.

The vaccine is usually made from cultures on Sauton's medium which is finally ground and suspended in dilute Sauton's medium or normal saline solution to the required strength.

It is issued in vacuum jars containing ice to be used up within a very few days.

Unpleasant local reactions are avoided in children in Birkhaug's (1944) multiple puncture method of vaccination in which a special instrument is used which introduces the vaccine into 40 skin punctures at one stroke. The vaccine is best introduced in cattle by the intravenous route.

Early attempts to verify the innocuity of B.C.G. cultures led to conflicting claims. While Watson, McIntosh and Konst (1928) found

the cultures somewhat virulent to some proportion of their guinea pigs, Petroff (1926-27) Dreyer and Vollum (1931) and Medler (1931) claimed that B.C.G. was not a fixed virus, as virulent dissociants could be isolated from it under certain conditions. Such unfavourable reports about B.C.G. were only a few compared to the mass of reports to the contrary. However, Calmette (1927) advised that B.C.G. should be periodically returned to the bile-glycerine medium in which it was originally attenuated and it is now generally agreed that B.C.G., if maintained according to Calmette's latest directions, is completely innocuous for all species of animals including man.

The use of the vaccine for the immunisation of children was being pushed forward cautiously but steadily until it received a set back from the disaster at Lubeck in Germany. Of about 250 children vaccinated at Lubeck as many as 73 died of tuberculosis. But the finding of a Commission of Enquiry that the disaster was due to contamination of the vaccine with a virulent strain of tubercle bacilli is now generally conceded. As a result, it is now strictly laid down that no other bacteriological activity could be allowed in a laboratory consigned to the preparation of B.C.G. In spite of the set back, B.C.G. vaccination has slowly gained ground and in recent years it has been applied enthusiastically in Canada, Poland, Rumania, Norway, Sweden, Uruguay and some other countries. Several million vaccinations have been done in children. Indeed it has been done in children. Indeed it has been used on a scale which has been exceeded only by such well-known products of proven value such as small-pox and T.A.B. vaccines. Now the most conservative of bacteriologists admit that the safety of B.C.G. is firmly established.

Not so unanimous are scientists on the question of its efficacy. This aspect has been studied by statistical analysis of infection among vaccinated and control groups of infants and by experimental infection of vaccinated and control groups of guinea-pigs and calves.

Most of the observations on human subjects from which conclusions have been drawn are of children from tuberculous families who were negative to the tuberculin test and were vaccinated 2 to 3 weeks later and kept away from the tuberculous environment for 2 to 3 months thereafter. Incidence of tuberculosis among the children so treated has been compared with that in a similar number in the same community whose parents had refused vaccination. Most of these observations indicate a decided lowering of mortality from tuberculosis among the vaccinated children. But the validity of these optimistic reports have been questioned on the ground that the parents who come forward for the vaccinations would be cultured and enlightened and would take hygienic precautions against the disease spreading to their children; also the removal of

vaccinated infants from the tuberculous environment may be a further contributory factor to their relative freedom from tuberculosis. This view received support when Levine & Sackett (1946) showed that when the control and vaccination groups were composed of children, by alternate section from among the consenting parents only, the tuberculosis mortality rate in the two groups became identical. But there are other carefully controlled work which has proved the usefulness of B.C.G. Working with tuberculin negative nurses entering the Ulleval Communal Hospital at Oslo as his subjects, Heimbeck (1936) showed that the rate of pulmonary tuberculosis among those who were vaccinated and consequently became tuberculin positive was only 0.11 per cent compared to 2.32 per cent in the unvaccinated controls. Aronson and Palmer (1946) working with non-reacting North American Indian children and young adults obtained again similar encouraging results.

The British attitude has been most critical of the utility of B.C.G. vaccination and their opinion, particularly if favourable, merits attention. Certain bodies representing tuberculosis associations jointly issued a statement [Lancet, 1946, July 27, 138-41] incorporating their assessment of the value of B.C.G. They believed that B.C.G. was harmless, had a considerable degree of immunising efficacy and that there was a demand for the vaccine from the public and the profession. Prof. Wilson (1947) would rather not have it introduced in England yet or at least would like to postpone its use until its utility was proved by a flawless well-planned trial under English conditions and then again would like to restrict it to those who run a high risk of infection such as infants from tuberculous families, medical students and nurses.

EXPERIMENTS ON CALVES

By its very nature, conclusions from experiments on animals are likely to be more authentic because all variable factors could be controlled to a large extent including the dosage of test infection.

There are several reports of the use of B.C.G. in guinea-pigs and calves. All the work on guinea pigs are highly optimistic. Of the work in calves some, particularly those pertaining to field trials, need not be reviewed here in detail as they are in the nature of crude observations.

According to Calmette and Guérin (1928) calves should be vaccinated soon after birth and at any rate not later than the fifteenth day and they should be protected from all contact with virulent tubercle bacilli for one month thereafter. The idea is to vaccinate them before they get infection. The value of B.C.G. could not be judged by vaccination of the older animals even if they had reacted negatively to the tuberculin test, as, after infection with a small dose of tubercle bacilli, it may take long before the allergic state develops.

The earliest of recorded experiments on calves comes from Calmette (1913) who vaccinated 8 calves with B.C.G., the dosage being 1 mg. followed by 5 mg a month later. One month after the second infection they were tested along with one control with 3 mg of virulent culture. The control died of generalised tuberculosis but the vaccinated calves, destroyed at intervals, revealed no lesions. Rankin (1929) vaccinated 62 calves with another 50 as controls. On test with virulent culture 66 per cent of the vaccinated were found to be protected against only 8 per cent among the controls. In a later series Rankin and Coworkers (1932) using new born animals allowed 17 vaccinated and 16 control animals to drink infected milk and to mix with infected animals for over 6 months. They found that 80 per cent of the vaccinated and 60 per cent of the controls were free from lesions. Watson (1933) vaccinated 44 calves with 75 to 100 mg B.C.G. by the subcutaneous method soon after birth and tested their resistance by getting them to cohabit with tuberculous animals along with 28 unvaccinated controls. He found that B.C.G. delayed the development of the disease in the vaccinated animals during the early period of life but after two years of age there was practically no immunity left.

There are reports of field trials based on vaccination of thousands of animals from France, Italy and Austria, apparently with beneficial results.

The most sustained and carefully controlled research on B.C.G. vaccination has been recorded by Buxton and co-workers (1931—1939). In preliminary experiments (1931) 57 calves were vaccinated by different routes. When tested 2½ to 3 months later they were found to have developed resistance and this was more pronounced among animals vaccinated by the intravenous route. But they (1939) found that B.C.G. in an oil excipient was inferior as an immunising agent. They found (1934) that complete immunity lasting for 6 months to one year could be established by the intravenous inoculation of B.C.G., 10 mg followed by 100 mg in three weeks. When infected after 1 year the calves developed a disease which was more chronic and less extensive than in controls. In the concluding phase of their work they (1939) tried to ascertain the effect of repeated doses of the vaccine on the duration of immunity. It was found that calves regularly vaccinated at six monthly intervals were resistant when infected by mouth after a period of three years; but if the calf were exposed to continued infection immediately after the first dose of vaccine or after 18 months, the resistance was reduced.

From a review of the foregoing literature, it may be seen that calves, if vaccinated at birth according to Calmette's directions, could be protected for about one to 2 years thereafter against tuberculosis. But there may be no absolute protection, nor are 100 per cent of cattle so

protected. Prolongation of the duration of immunity by repeated vaccinations is not a practical proposition, as, unless protected from sources of natural infection during the interval, the purpose of such treatment will be defeated. Because of these limitations the vaccination of calves has not become very popular. There is another reason why vaccination has not gained much ground, particularly in progressive countries. This is because B.C.G. vaccination induces tuberculin sensitivity and this is not compatible with the eradication policy which is based on periodic tuberculin testing and segregation or elimination of reactors.

Before India could decide upon a course of action as regards vaccination of her cattle, it will be necessary to ascertain the exact prevalence of the disease in different parts of the country. If it was sufficiently small, an eradication policy based on the result of the tuberculin test will be profitable to adopt. If the disease proved to be very extensive, it will be necessary to examine whether it would be worthwhile applying the vaccine with all its limitations and under the conditions pertaining to the use of the vaccine.

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INFECTIVITY OF THE SALIVA OF RABID HERBIVORA*

By

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In discussing rabies, I do so, appreciating fully well that authorities are not in complete agreement regarding the infectivity of the saliva of rabid herbivora. For the sake of brevity, I shall omit a resume of the literature on this subject and shall endeavour to confine my remarks to information of practical interest on the question.

Were rabies a disease merely of the dog or even one capable of transmission to all mammals except man, it would not merit much attention. All warm-blooded animals are susceptible to rabies but dogs, jackals and wolves, from the nature of their biting propensities, are better suited to convey the disease to man and other animals.

From the years 1902 to 1912, over 17,000 persons were given anti-rabic treatment at the Pasteur Institute, Kasauli and the animals responsible for biting them were as follows:—

Dog	...	14,730
Jackals	...	2,471
Wolves and foxes	...	71
Horses	...	140
Cats	...	78
Cattle	...	16
Infection from human saliva	...	79.

The incidence of rabies in both bovines and equines is very small and would hardly justify the introduction of special laws in order to protect man if these animals alone were involved.

It is a well-known fact that rabies is a neurotropic virus. Bertarelli (1919) claims to have shown that the virus gains access to the salivary glands by travelling along the peripheral nerves and not by way of the blood stream. Remlinger (1919) concludes, however, that for sometime before the onset of visible symptoms, there exists in rabies a stage in the blood which is not manifested by any symptom except perhaps by a few attacks of fever and that at this stage the female may even transmit the disease *via* the placenta to her progeny. It appears justifiable to infer that the animal at this stage is also capable of infecting man and other animals by means of its saliva, milk, etc. If indeed the rabies virus is discoverable in the blood some time before death there is no reason to doubt that it may also be found during the same period in the saliva and other discharges.

Human patients treated at Kasauli in 1927-28 were those who had been bitten by, or came in contact with the saliva of, a great variety of animals suspected or proved rabid. The animals responsible were the dog, jackal, wolf, hyena, fox, badger, mongoose, cat, leopard, horse, mule, donkey, goat, buffalo, cow, camel, monkey and man. In 84.4 per cent of the cases the dog was responsible and in 12.6 per cent the jackal, leaving only 3 per cent for the other animals mentioned above.

The incidence of rabies in all animals is high in Lahore. Not a month passes without a few cases of rabies in horses and cattle in the contagious ward attached to the local Veterinary College. The writer, when he was officiating Professor of Pathology in that college for about 2 years, came across a number of cases of rabies in cattle, horses and buffaloes. One of the characteristic symptoms of rabies in these animals is excessive and profuse frothy salivation. The stall in which the rabid animal is kept soon gets wet with saliva in a few minutes after receiving the animal. The syces and cattle attendants often get contaminated with the saliva of these animals in attempting to clean the mouth parts before they are diagnosed as cases of rabies and in handling the contaminated straw, leather fittings and utensils in the stall. But there are not many histories of persons developing rabies through this practice. Veterinary surgeons who handle such cases before diagnosis, in attempting to administer medicines do get contaminated with saliva, but up till now there is no history of any veterinary doctor developing hydrophobia by handling rabid herbivora.

The question is therefore often raised as to the possibility of rabies transmission to man through the saliva of rabid herbivora. The writer, therefore, availed of the opportunity to conduct the following experiment to determine the infectivity of the saliva of a rabid horse.

The saliva and mouth washings of a horse which died of rabies were collected, diluted with normal saline solution and filtered through Berkefield's filter to eliminate the secondary organisms. The filtrate was then centrifuged for a long time and a few drops of the sediment were inoculated subdurally into two rabbits. The rabbits were kept under observation for over a month and were discontinued 38 days later as symptoms characteristic of rabies did not develop in them.

Two more rabbits were inoculated subdurally with a few drops of a filtered brain emulsion of the horse: but these rabbits died of rabies one on the 13th and the other on the 14th day after inoculation showing the characteristic *ante mortem* paralytic symptoms two days before death in both cases.

As only one case was available at a time and as the author's time was mostly occupied by other duties it was unfortunate that no more experiments of this nature on the subject could be undertaken for confir-

* Read at the Indian Science Congress in Jan. 1940.

mation of the results obtained. Should this work be continued it is hoped that valuable data would be collected in confirmation or otherwise of the results obtained by the author.

DISCUSSION

Pawan (1937) collected the saliva from the mouths of 6 infected cattle and 2 horses suffering from paralytic rabies in Trinidad on sterile swabs and rubbed the swabs on the scarified abdominal wall of rabbits. He was able to produce paralysis and subsequent death in every rabbit 8-15 days after infection. This experiment was repeated by him with the saliva of six rabid persons and similar results were obtained. In a similar series of experiments, this worker was able to demonstrate rabies in the saliva of Vampire bats (*Desmodus rotundus murinus*).

But Paralytic rabies in man and animals in Trinidad is transmitted by Vampire bats and it is a well-known fact that Vampire bats are not the specific hosts of the virus of rabies. The canine tribe is the genuine specific host of the virus of rabies, a fact which was well-known even in the pre-historic days of Homer and Aristotle. Its occurrence in the Vampire bats is regarded by Pawan (1936) as a form of aberrant or strayed parasitism and he believes that such a migration of a parasite to a new host often leads to an alteration in the biological properties of the parasite and the formation of a new variant or mutant. Saliva of rabid dogs rubbed on the scarified abdominal wall of rabbits does not produce rabies in all infected cases. Hence the experimental data obtained in Pawan's experimental rabbits regarding the infectivity of saliva of rabid cattle and horses cannot be applied as a general rule for rabies occurring in the other parts of the world.

It may be argued that the process of filtration and dilution had the effect of eliminating or destroying the virus contained in the saliva as the virus is said to occur usually in an intracellular position. In the absence of filtration, the secondary organisms contained in the saliva, may readily set up inflammatory conditions on subdural inoculation. Moreover, the cell-free saliva of canine animals is not virus-free. The bad effect of dilution with normal saline solution has been considerably neutralised in this experiment by the filtrate being centrifuged and the bottom part of the centrifuged filtrate being used for inoculation. Dilution with a small quantity of saline solution was unavoidable to make up sufficient quantity for filtration.

Cunningham (1926) has recorded an interesting case of "Death from hydrophobia eight months after being licked by a rabid buffalo" which is the only record of its kind in India during the last so many years. A mason died of hydrophobia after an illness of 2 days. An enquiry made at his village elicited the following information from his relatives.

"The mason had cracks in his hands usually. Eight months before his death he was known to have administered some medicine to a rabid buffalo which died of rabies due to a dog-bite; the mason thus came in contact with the saliva of the rabid buffalo. The relatives had no knowledge of the mason being bitten by a rabid dog or any other carnivora at any time before or after being licked by the buffalo and this possibility was considered unlikely by them."

On the basis of this history gathered from the illiterate relatives of the dead mason, Cunningham concluded that the saliva of rabid herbivora was capable of transmitting the disease "under circumstances at any rate", and that infection might occur after mere contact with the saliva of an infected animal.

To the writer, however, these conclusions appear to be of a premature nature, as they are based upon the statements of illiterate relatives of an illiterate mason and as there is no experimental data to support the infectivity of the saliva of rabid herbivora. The prolonged incubation period of eight months in this case does not warrant an entire absence of a subsequent infection.

SUMMARY

Rabies in the domestic herbivora is not so uncommon as it is believed to be, though it is not met with so commonly as in dogs. Profuse salivation is one of the constant features in rabies in horses and cattle, and as there is not much data available regarding the infectivity of their saliva and mouth washings of a rabid horse and inoculated the centrifugalized filtrate subdurally in two rabbits. Both these rabbits showed no ill-effects and they were discontinued from further observation 38 days after inoculation. A filtered brain emulsion from the horse, on the other hand readily produced rabies and killed two rabbits which were inoculated subdurally, 13 and 14 days after inoculation respectively. The experiment suggests that the saliva of a rabid horse does not contain the specific virus.

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A PRELIMINARY REPORT ON THE INCIDENCE OF CORYNEBACTERIUM PYOGENES IN ANIMALS*

By

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It is known that *Corynebacterium pyogenes* is ubiquitous in nature and is the cause of suppurative and pyaemic conditions on the surface of the body or in the internal organs; but its pathogenic role in India is unknown. During the course of routine bacteriological work this organism was first noticed by the writer in goats which were used for goat virus production at the Goat Virus Depot, Bombay. In certain seasons particularly during the rains a certain percentage of goats purchased for the goat virus production maintained an eccentric body temperature and often died. An investigation into the cause of death of these goats was carried out with the result that *C. pyogenes* infection was found to be the cause in majority of cases. The chief *post mortem* change observed was yellowish white exudate (or milky) in the peritoneal cavity. A few goats have in addition exhibited a suppurated gland, the contents of which were greenish white and sometimes cheese-like. Pneumonic lesions in the lungs have also been very frequently observed in these goats. *C. pyogenes* was grown in pure culture from the peritoneal exudate and suppurated glands.

In one instance a certain brew of goat virus was supplied to two distant places by the Goat Virus Depot, Bombay. At both the places this virus has given rise to abscess formation at the site of injection in cattle, an appreciable number of which succumbed. The cultural examination into the contents of abscesses has in all instances given rise to a pure culture of *C. pyogenes*.

During the last three years 61 samples of milk from mastitis in cattle were subjected to cultural examination and *C. pyogenes* was isolated in 18 instances and streptococcus mastitis was confirmed in 56 cases.

In one instance a sample of pus from the internal organ of a leopard belonging to the Victoria Gardens, Bombay Municipality was received. Cultural examination into it has yielded *C. pyogenes* in a pure culture.

The strains of *C. pyogenes* isolated from the peritoneal exudates of 300 goats, from the abscesses in cattle, from mastitis cases and also from the leopard were sent to the Indian Institute of Veterinary Research, Mukteswar, which has confirmed the identification of the organism in each case.

* Submitted to the Extraordinary General Body Meeting of the Bombay Veterinary Medical Association, 1947.

This year under the Bacteriological Research Extension Scheme a plan has been drawn up to find out the *flora* of wounds, yoke galls, abscess neck and similar cutaneous lesions in cattle which are admitted at the Bai Sakarbai Veterinary Hospital, Bombay. So far specimens of purulent matter from 24 cases which included unopened abscess neck were subjected to the Bacteriological examination with the results that *C. pyogenes* was isolated from 17 cases. These results are very interesting in as much as the wounds and abscesses are the most common diseases treated in Veterinary Dispensaries in India and so far no specific remedy on rational lines is practised in treating these cases except the application of antiseptics for a prolonged period until a cure is effected.

A detailed report of the findings of the author will be published later.

TUMOURS IN THE DOG

By

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Tumours are of comparatively common occurrence in the domestic animals and various kinds of them have been met with in the dog.

During the year 1946—47, 19 dogs were treated at the Civil Veterinary Hospital, Murree Hills, for tumors of different types as tabulated below:—

Serial No.	Type of tumour.	No of cases.	Location.
1	Fibromata	1	Neck.
2	Papillomata		
	(a) Buccal warts	4	Mucosa of cheeks, tongue, palate and pharynx.
	(b) Skin warts	3	Neck, abdomen, back.
3	Adenomata	2	Sebaceous glands.
4	Carcinomata	1	Skin.
5	Venereal Sarcomata	8	Genitalis.

Fibromata:—The only case of this kind that was treated was in a small dog, aged about 9 years. The growth was of the size of a walnut and very hard, was present in the middle of the neck and according to the owner, was of 8 months duration. Histological examination of the tumour after operation showed it to be a hard fibroma.

Papillomata are the commonest benign epithelial tumours occurring in the dog. They originate from the surface of the skin or mucous

membranes as warty, villous or finger-like projection and may be single or multiple but never metastatic in nature.

(a) Contagious buccal papillomatosis :—Buccal warts in the dog are said to be due to a filterable virus and the disease is reported to have been experimentally transmitted to other healthy dogs. Four cases of buccal warts, (2 spaniels, 1 Wire-haired terrier and 1 Alsatian) were treated. The growths were seen on the mucous membranes of the cheeks except in case of the one Spaniel, which had them on the dorsum of the tongue and pharynx also. The warts had a tendency to bleed easily when damaged. In one of the cases, they disappeared even without any treatment while in other cases surgical removal and cauterization were resorted to.

(b) Skin Warts :—The skin warts were mostly of the type of a pea and were seen in three aged dogs over the skin in the region of their neck, abdomen and back.

ADENOMATA

Adenomata are benign comparatively slow growing glandular epithelial tumours and they always originate in some gland and may be either single or multiple. They may assume either the tubular type or the acinous type. According to Muller and Glass (1937) when the basement membrane is penetrated by such adenoma and other growths they become carcinomatous in nature.

No 1. A cross-bred bull dog, aged about 4½ years, had at the time of admission a hard growth of the size of a goose egg at the posterior aspect of the right elbow joint. It was found to slowly increase in size and several such growths started to appear in other parts of the body. The dog became very poor in condition. These growths varied in size from ½ of an inch to 1½" in diameter and were noticed on the limbs, chest and abdomen. Most of them were knotty to the touch and hard in consistency but a few of the bigger ones were somewhat soft and yielded to pressure. They were firmly adherent to the skin but were circumscribed and otherwise loosely placed over the underlying or surrounding structures. The skin over the long standing tumours was practically devoid of hairs. When the case was examined a few more growths of varying sizes were found to have developed subsequently on the sides of the neck as well as in the region of the throat. Those that had developed earlier were found to have increased in size. A few of these were removed surgically and histo-pathological studies of section of these revealed all the features of an adenoma; some of them showed epithelial glandular structures with cystic formation.

No. 2. The subject was an aged Labrador dog. It had numerous rounded sessile growths varying in size from that of a pea to a marble, over the skin in the region of the back. The duration of these growths

was not known. The case was cured completely after surgical removal of these growths.

CARCINOMATA

Carcinomata are malignant neoplasms, the chief features of which are rapid proliferation and accumulation of epithelial cells. Of all the tumours, carcinomata are of comparatively frequent occurrence in the dog and their frequency increases as the age advances. As regards their distribution, the urino genital system appears to be the more commonly affected than the other systems. The progress in such cases is invariably unfavourable because the tumour has a tendency to become metastatic.

No. 1. A black Spaniel dog, aged about 4 years was brought to the hospital on 13-6-46. A few growths about 1/6 of an inch in diameter were noticed on the left side of the upper and lower lips, at the angle of the mouth. They had a tendency to increase in size and the larger of them showed ulceration. There was also the history that the dog was previously operated upon about 9 months back for the same trouble and at the same seat and the number of growths present at that time were comparatively less. Similar growths of varying size were also seen in the region of the throat and its neighbourhood. The condition of the dog was fair at the time of examination. Further growths developed gradually in other areas such as the ears, head, neck, abdomen, chest and hind limbs. Some of the older ones tended to increase in size and coalesce with the neighbouring ones forming large, raw, irregular ulcerating areas and discharging foul smelling material. The dog started to go off-feed and became emaciated and dull and presented all the signs of cancerous-cachecia. Surgical intervention was of no avail. Secondary growths continued to appear all over the body. The characters of these malignant growths on histo-pathological examination were found to be those of squamous-celled epithelioma. The dog was eventually put to sleep on 4-7-46.

CONTAGIOUS (VENEREAL) NEOPLASMS OF THE DOG

They are seen affecting chiefly the genitalis of both the sexes. Jackson (1936) states that the tumour may occur in other parts of the body quite remote from the genitalis i.e., in the region of the neck, back, abdomen, limbs, throat, lips, rarely even in the internal organs such as spleen, kidneys, lungs, etc. During the years 1946-47, eight cases of venereal sarcoma were treated at this hospital.

Mode of transmission.—The disease is conveyed chiefly through coitus. A mere rubbing of a piece of infective tumour on an abraded mucous surface is sufficient to transmit the disease. Transmission may occur through bites even (Jackson, 1936).

Symptoms.—The symptoms vary according to the extent of lesions, the condition and the age of the animal, the growth being more rapid in older animals and in those that are in poor condition.

The lesions generally commence with a slight tumefaction of the tissue around the genital organs in the bitch. This is usually followed by the development of nodular growths on the vagina between the vulva and the urethral orifice. These growths continue to increase in size and multiply and many coalesce forming large pinkish or greyish masses. In advanced cases a muco-purulent, foul smelling bloody discharge escapes from the vulva. In the males the growths are found on the penis especially around its base, from where they may extend to the sheath and other parts. They bleed easily on manipulation and there is a bloody discharge from the orifice of the sheath.

In early stages of the disease, surgical removal of the growths followed by thorough cauterization may be successful, but in advanced cases surgical treatment is of no avail.

ACKNOWLEDGMENT

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BRAHMINI BULL—ITS PAST, PRESENT AND FUTURE

BY

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Brahmini bull, deified as a breeding bull, is a peculiar feature of the Ongole tract, in the Madras Presidency, which, as is well known, is the home of the world famous triple-purpose Ongole breed of cattle. In this tract, there has been a practice from very early times of dedicating good breeding bulls to the local deity and deifying them as Brahmini bulls. It was not merely a religious function, but it was a religio-social and economic function, as most of the traditional Indian customs are. Usually when an affluent and philanthropic man of a village dies, his relatives dedicate the best bull-calf in memory of the deceased. There were in the past three parties for the dedication of a bull viz. (1) the party that was offering, (2) the temple authorities who accepted the bull

and (3) the general public of the village who approved of the bull as the right type. The third party gave its assent only when an expert judging-committee consisting of leading livestock breeders, had examined the animal in detail, and declared the animal as suitable for dedication; their selection was not confined to a few but to a very large number of bull-calves that were brought; and they approved of the dedication only when any one of the calves was found to satisfy their critical judging. The dedication is a very impressive ceremony and is performed with the usual temple rites on the day of the funeral ceremony (fourteenth day) or *Sradh* of the deceased. The young bull is branded by the priest usually on the right thigh and, if the deceased is a *Shaivite* (follower of shiva) the brand mark is in the shape of "Conch-shell" and if the deceased is a *Vaishnavite* (follower of vishnu) the brand mark is in the shape of a wheel or *chakra*. Such a bull is known as a Brahmini bull. Dedication to the local deity gave the bull a certain amount of liberty to feed on the choicest of crops! The bull which, from the then existing standard, was the best of its kind, used to get plentiful supply of fodder and concentrates from the public who know well that they stood to gain more from such a fine bull. It should have been a grand sight in villages for such a mighty, well-fed and groomed bull, accompanying the village herd of cows as a guardian. And if the ongole breed has been preserved and handed over to us, it is mostly due to this single traditional practice of maintaining worthy Brahmini bulls. This practice clearly shows the community sense that used to exist in villages for livestock improvement. It is well to remember that the ongole tract of the past was built upon the basis of an economy of livestock rearing. Those were the days when Brahmini bulls enjoyed popularity and served a very useful purpose in rural economy.

Coming to the present day, we find that Brahmini bull is a misused and abused 'stud' animal. In many cases, it is a half-starved, rickety creature which, on humanitarian grounds should be destroyed. This is mostly due to the exploitation of the religious aspect, ignoring the duties and responsibilities to the community. The original object of selecting the best bull possible has been lost sight of and the religious aspect is exploited to such an extent that any scrub or male calf is dedicated! The result is that we have Brahmini bulls which judged from any standard should not have been dedicated at all. It should however be noted that the present prohibitive cost of bulls is also responsible for the present low standard. It is out of place to discuss in detail why such a fall come about in the outlook of people. Whatever might be the reasons, none can dispute the fact that the abuse of an once noble custom has been a potent source of mischief in bringing about the deterioration of these fine stock, of which any land could be proud. For the dedication of the present day Brahmini bull, no expert committee to judge the prospective bull is ever consulted. In the absence of such critical public opinion any scrub bull is dedicated nowadays.

In consequence, these Brahmini bulls which do not evoke either the respect or love are chased out of fields and are sometimes maimed or even killed. In the words of Capt. Littlewood in his book 'Livestock of Southern India', "owing to the high price of foodstuffs the donors of these bulls are criticised instead of praised and they generally have to take charge of and stall feed them during the time the crops are on the land."

What of the future? Should we continue to have this institution of Brahmini bulls or should we legislate and prohibit the dedication of Brahmini bulls? There can be only one answer from those who know Rural India. It is not possible to kill such a hoary custom. Let us therefore restore it to its original standard and glory. That way lies the path of wisdom. I therefore suggest the following procedure:—

1. By legislation it should be made unlawful to dedicate a bull for breeding purpose unless the bull is approved by temple or Taluk Livestock Committee consisting of (1) a representative of Animal Husbandry Department, (2) a prominent local breeder and (3) an important non-official interested in livestock improvement. This Committee will do the function of the selection committee of old.

2. After dedication, the bull should be maintained by the temple authorities from temple funds under the periodical supervision of the above committee. The temple authorities may be permitted to accept donation or gifts in kind for the maintenance of the bulls.

3. The Government, that is, the Animal Husbandry Department, should arrange for the services of a Stockman to attend on such bulls, to arrange to maintain service registers and educate the people on the importance of other breeding records.

Apart from the dedicated bull or bulls, the temple authorities may keep some bulls of their own for the same purpose, depending on the local demand.

4. After reorganisation on the lines suggested above, the chances of starting artificial insemination centres should be studied.

The existing Brahmini bulls should be subjected to the scrutiny of this expert committee and if they are not fit for breeding purposes, they should be castrated and prevented from propagating degenerate stock. In advocating this, I am happy to find that Mr. Parr, Deputy Director of Agriculture, United Provinces, in his note for the 3rd Animal Husbandry Wing meeting has remarked:— "This cooperative attitude towards stud animals can further be encouraged and it is believed, can be directed to secure results which will change the present trend of livestock degeneration to one of livestock improvement".

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Editorial

THE FIRST YEAR.

I cherish the hope that my followers will blossom forth when I am no more, and what they have been silently imbibing all along will then bear fruit.

GANDHIJI.

On the 15th August 1948, our country celebrated its first year of Freedom and Independence. The celebrations had naturally to be on a solemn, subdued plane, and conducted with great moderation, as, during this very first year, we had the greatest misfortune to lose the Father of the Nation, Mahatma Gandhiji. Agreeably to the instructions of the President of the Indian National Congress, 'the day was observed not so much as a day of rejoicing, but as a day of Remembrance for all the sufferings and sacrifices undergone and as a day of re-dedication to the service of the people so that the manifold problems that face us may be solved to our satisfaction.'

These twelve months have been really and truly a period of 'blood and tears' for the country. Problems of unimaginable magnitude have rocked the country as never before, either here or anywhere else in the world: but, fortunately, our leaders, the chosen followers of Gandhiji, have stood firm, undeterred and undismayed, and have safely pulled the country out of this travail and suffering. The opposing and conflicting forces are just subsiding. Naturally, many a problem confronting the nation remains unsolved. Scarcity and shortage of foodstuffs still trouble us and 'the common man' for whom the freedom's battle was waged has not been able to feel the glow of freedom in him. His 'unhappy' lot still remains as it was. And, therefore, this

occasion of the anniversary of our Freedom must be an occasion of deep introspection for each and every one of us. Have we worked and contributed for the welfare of the masses and the well-being of the country? Have we worked for stabilising our Independence? — these should be queries unto oneself. As the Governor General, H. E. Sri. Chakravarty Rajagopalachari, has said, 'To be independent is only an opportunity, and it is only integrity in public life, and industry in constructive work that can build, and, making up for lost time, bring out the potential greatness of our country.' This integrity in public life, which we must emphasise and underline with all our strength, is the key to our progress and advancement. To quote the words of Pandit Nehru, 'The primary thing in an individual is his integrity. If he is not a person of integrity, then it does not do very much good, even though he possesses high ideals, from a political or economic point of view..... Integrity is a basic thing out of which policy may grow, but integrity is not policy'. These fundamentals, so necessary for the Nation-building, are to be borne in mind by every one of us and we should all go out 'full steam ahead' to the work on hand and contribute our mite for the uplift of the common man whose whole economy is built on the economy of his livestock.

And so, Amen to the message of our Prime Minister: "On this anniversary of our Independence, we dedicate ourselves anew to the great cause of free India and her people. May we prove worthy.—Jai Hind".

RAI BAHADUR P. N. NANDA

We congratulate Rai Bahadur P. N. Nanda, on his appointment as Animal Husbandry Commissioner with the Government of India. This is the first time that the appointment has gone to one like the Rai Bahadur who is so very well equipped to occupy the post. Coming immediately after our independence, this is a good augury for the development of the long neglected livestock of the country.

Born in Quetta (Baluchistan) in 1901, matriculated from the Government Sandeman High School, Quetta, and standing first



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in the Province, Mr. P. N. Nanda joined the Government College, Lahore. After a course of studies there, he proceeded to England and joined the Royal Veterinary College, London, in October 1921. He took the Diploma of M.R.C.V.S., in July 1925 and returned to India in September 1925. After a period of training in the Civil Veterinary Department, he was appointed in 1926 as an Assistant Superintendent at the Government Cattle Farm, Hissar, and remained there till 1930. Thereafter he was deputed for a course Postgraduate studies at the I. V. R. I. Mukteswar.

On return from Mukteswar, he was appointed as officiating Livestock Officer to the Government of Punjab and worked as Superintendent, Civil Veterinary Department at Ambala, Ferozepore and Rawalpindi for varying periods. He, however, remained in Rawalpindi for six years and re-organised Dhani cattle breeding scheme which has resulted in great improvement of the breed. Several other schemes also were initiated by him for the improvement of sheep and camels.

In February 1939, he became the Superintendent, Government Cattle Farm, Hissar, when the whole tract was in the grip of severe famine, with several animals dying daily at the farm. By his rigorous efforts and judicious management, the mortality was considerably reduced within two or three months and the general condition of livestock improved. While at the Farm, he effectively controlled the heavy incidence of Tuberculosis, and, in a short period of five years, the incidence was brought down from 30 per cent. to less than one per cent. The breeding policy of the farm was altered and plans were laid to develop the indigenous Haryana breed which is preferred to the Hissar breed all over the tract. He also initiated special work on the development of sheep and wool at Hissar, whereby it has been shown that, by proper selective breeding, fine wool can be produced in Bikaneri and Lohi breeds. He was also then a member of the Animal Breeding and Fodder and Grazing Committees of the Indian Council of Agricultural Research and also acted as correspondent for the 'Indian Farming' on behalf of the Animal Husbandry Department, Punjab. In appreciation of his services the title of Rai Bahadur was conferred on him in 1943.

For a short period from 2-5-46 to 6-12-46, he acted as the Director of Veterinary Services, Punjab, after which he was appointed as Director of Animal Husbandry, Bombay Province, where he stayed until December 1947. While in Bombay, he undertook the task of reorganisation of the Department and this was practically completed before he left Bombay to take over the present appointment of Animal Husbandry Commissioner with the Government of India.

Rai Bahadur Nanda is thus well equipped for the high post he is holding and we look up to him to initiate far-reaching reforms for the consolidation and development of the profession. By far the pressing need of the Veterinary profession in India is the formation of an Indian Veterinary Council and, as the head of the profession in this country, we expect Mr. Nanda to take early steps in the matter.

We wish him all success in his career.

MAJOR S. DATTA

Another appointment which has given us great pleasure is that of the Director of the Indian Veterinary Research Institute, at Mukteswar. The pleasure is enhanced by the fact that the post has gone to one so well-known as Major S. Datta, B.Sc. (Hons), D. Sc. (Edin), M.R.C.V.S., D.T.V.M., F.R.S. (Edin.), F.N.I., who has contributed so much to our profession.

Major Datta had his education early in the Scottish Churches College, Rajshahi College and the University College of Science, Calcutta. While studying for M. Sc. (Chemistry), he was a student of the late Sir P. C. Ray and it was this saint-scientist who was responsible for Dr. Datta's taking up the studies in Veterinary Science. With a Govt. of India scholarship, he joined the Royal Veterinary College, London, and became a member of the R.C.V.S. in 1925.

Soon after, he was appointed as a lecturer at the Bengal Veterinary College. While there, he had the opportunity of working with the late Colonel Acton at the Calcutta School of Tropical Medicine. In 1930 he joined the Mukteswar Research Institute

as a Veterinary Research Officer. Since then, he has acted as the Officer-in-charge of the various sections there.

During 1938-39, he attended a full post-graduate course at the University of Edinburgh in all aspects of animal husbandry and on its conclusion he took his Diploma of Tropical Veterinary Medicine. At the same University, he carried out independent research for 18 months and obtained the degree of D. Sc. in Veterinary Science in 1941, being so far the only officer in India so qualified.

As a recognition for his original work, he was elected to the Fellowship of the Royal Society, Edinburgh, and also of the National Institute of Sciences of India. He was elected as Vice President of the Parasitology Section of the International Veterinary Congress held at Zurich-Interlaken in 1938. He also actively participated in the Imperial Veterinary Congress in 1938 and attended the International Genetics Congress in 1939 as a representative of the Govt. of India.

In the latter part of 1941 he joined the Army service and remained there till December 1948. He has had the unusual advantage of being stationed in many and varied parts of the country including Bengal, United Provinces, the Punjab, Assam, Madras, Central Provinces and Ceylon. His experiences and knowledge of all these places make him a truly All-India man. His war Service has brought him the award of the 1939-45 and Burma Campaign 'stars' and India service and war service 'medals'.

His work on the various problems of our profession is known very well. He has diagnosed several animal diseases for the first time in India and has been responsible for the initiation of a number of new researches. His investigations on a group of diseases of unknown etiology, Bursati, Enzootic Bovine Haematuria, Bovine Nasal Granuloma, Lichen tropicus, equine debility etc., to name only a few, have been of outstanding merit and have received wide publicity.

Dr. Datta has all along taken a comprehensive view of the scope of Veterinary Science as including animal husbandry, animal nutrition and animal genetics and not merely the pathology

of domestic animals. As far back as in 1929 he sent up a proposal for coordinating under one department in India, the four branches of animal husbandry, genetics, nutrition and diseases. He made recommendations to the Animal Husbandry Wing Meeting in 1935 for the adoption of artificial insemination as a method of livestock improvement in India and also for the initiation of comprehensive research into drug resources of India in the field of Indian Veterinary problems.

Now that Dr. Datta has become the Director of the Institute, we sincerely hope that he will be able to work out his ideas of scientific advancement on a much wider scale. He is still young in years - he is under 50 - and possesses requisite driving force and energy.

We wish him a long and useful successful career.

Dr. G. D. BHALERAO

The distinguished parasitologist, Dr. G. D. Bhalerao, Ph. D., D. Sc. (London), for some time the Director, Indian Veterinary Research Institute, Izatnagar-Mukteswar, recently returned by air from Washington after attending the Fourth International Congresses on Tropical Medicine and Malaria. At the Congresses he read a paper on "Schistosomiasis in Animals", which was highly appreciated. At the plenary session of the Congresses Dr. Bhalerao was introduced as the Leader of the Indian delegation and later he was elected as a Vice Chairman of the Section of Tropical Veterinary Medicine.

As our readers are aware, Dr. Bhalerao has been one of the earliest pioneer workers in the field of Veterinary Parasitology in this country. His contributions to this branch of study have brought out clearly the great importance that parasites and parasitism play in the development of our livestock. We congratulate Dr. Bhalerao, on his successful foreign tour, and wish him still greater success in his work.

T. M. Z. MAHAMOOTH

With the advent of freedom, the government of the Dominion of Ceylon has lost no time in appointing Ceylonese as heads of various government departments. The veterinary profession and the people throughout the country welcomed with great enthusiasm and pride the appointment of Mr. T. M. Z. Mahamooth, G.B.V.C., M.R.C.V.S., in April this year, as Head of the Veterinary Section of the Department of Agriculture.

Born 45 years ago, Mr. Mahamooth, following the footsteps of his father who was, at that time, a veterinary officer of the former veterinary department, joined service as a Livestock Inspector, when he was only nineteen years of age, immediately upon graduation from a senior high school. Being gifted with a great capacity for organization and demonstration of practical ability and love for veterinary work, he, after a couple of years, was sent by the Ceylon government to pursue a course of study at Bombay Veterinary College in India wherefrom he graduated in 1928. On his return to the Island Mr. Mahamooth was stationed in various parts of the country campaigning against rinderpest.

The success he achieved and the contribution he made towards the eradication of rinderpest from the Island was considered an outstanding accomplishment for which he was again awarded a government scholarship to pursue further studies in the United Kingdom in 1933. He took the diploma of the Member of the Royal College of Veterinary Surgeons in 1938 from the Royal (Dick) Veterinary College, Edinburgh, Scotland. On his return, he was appointed veterinary research officer of the amalgamated department of agriculture which position he held till 1944, when he was designated acting chief of the Veterinary Research Branch of the Department of Agriculture. At the time when Mr. Mahamooth took up the reins of administration, rinderpest was again rampant all over the Island. But, due to his foresight and efficient administration, even with his limited staff of veterinarians and livestock inspectors at his disposal, he was able to clear the country of rinderpest and, happily for the past two years, the Island is completely free of the disease.

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Director Mahamooth assumes leadership of Ceylon veterinary services at the most critical time of the country's progress when the government faces various important livestock problems. Under his administration, however, the country hopes to have a good, if not the best, veterinary public service in South-East Asia with an extensive programme of animal disease control organization.

Our best wishes for his success in his work.

Clinical Articles

PENICILLIN IN PLEURISY

By

P. SRINIVASA RAO, G.M.V.C.,
Madras

and

RAO BAHADUR R. SWAMINATHAN, B.A., G.M.V.C.,
Madras

The following case is considered worth recording.

A well bred Alsatian bitch, aged about 6 years, had been left in charge of the servants during the absence of the owner. Unfortunately, the animal was neglected and badly kept.

On February 1948, the animal was brought to the clinic of the former author (P. S. Rao) in a very pitiable condition with the history that it was dull and off-feed for nearly a week and that it would not lie down freely. On examination, the case was diagnosed as one of Pleurisy with effusion on the right side. With a labile pulse rate, great dyspnoea, oedema of the limbs and total inappetance, the bitch's condition was indeed very critical.

A dose of Coramine was given at once. A few minutes after, the chest was tapped and about 12 ounces of sero-sanguineous fluid was removed. There was immediate relief in the dyspnoic symptoms. Another dose of Coramine injection was given after the aspiration and the dog was kept comfortably. It lay down with ease for the first time during the week and rested itself very well. During the night, it lapped a quantity of milk by itself.

In the course of the next 48 hours, decubitus ulcers appeared over the region of the left hip with extensive infiltration of purulent fluid

throughout the entire leg. The animal was highly toxæmic and was quite prostrate. The pulse was feeble. Examination of the chest revealed that pleuritic effusions had taken place again; but it was only very little.

Penicillin therapy was undertaken immediately and five lakhs of units were injected in the course of five days at the rate of 20000 units five times a day. The response was spectacular. In the course of a week, the dog became bright and cheerful and looking practically alright. The respiration and pulse rate became normal, and except for a long period of convalescence, which should be put down to the previously neglected management, the recovery was uneventful.

The bitch was seen after 5 months during the latter part of July 1948 and was found to be in good condition. It had even come on heat.

HYPERTONIC SALINE IN UMBILICAL HERNIA IN CALVES

By

F. C. BHUYAN, G.B.V.C.,

Veterinary Assistant Surgeon, Nowgong, Assam.

In January 1940, while I was in charge of the Veterinary Hospital at Silchar, I was called to attend a young calf belonging to the Deputy Commissioner, Cachar, with a (puffy) fluctuating swelling of the size of a hen's egg, in the region of the umbilicus.

History of the case.—The owner got the calf and its mother from Halflong Hill, about 150 miles away from Silchar. The calf was then 10 days old and was very sick after the train journey. On examination, the case was diagnosed as one of reducible umbilical hernia. The usual treatment viz. pressure bandage with 'Cork plaster' was tried for a week but it was of no avail. The owner was not willing to have an operation performed and wanted to have it destroyed; but, at my earnest request, agreed for a week's trial.

Treatment.—After reducing the hernia, I injected 1 c.c. of hypertonic saline, (1.25%) alongside the edge of the umbilical ring in 4 to 5 places with a fine hypodermic needle, taking particular care to avoid any injury to the intestines. To stimulate and hasten constriction, a pressure bandage was applied. This treatment was continued for three days. Then an appreciable improvement in the constriction of the ring had noticed. The treatment was continued up to the seventh day when the ring had closed and there was no protrusion of the intestines. A simple pressure bandage was put on for a few days more as a precautionary measure. I saw the case a year later when the hernia ring was found to be completely closed.

Second Case.—In December 1945, during my absence, my cow calved a healthy calf at night, probably in the standing position. The umbilical cord had got severed too close to the umbilicus. I saw the calf on the seventh day with a puffy fluctuating swelling—size of a duck's egg—at the umbilicus. On examination, I found it to be umbilical hernia (reducible). The treatment given to the first case was adopted in this case also and, in ten days, the hernial ring had become completely sealed.

I am prompted to record the above successful treatment in the above two cases in the hope that it may be of use to my colleagues in the profession.

PHENAMIDINE IN CANINE BABESIOSIS

By

B. S. P. RAO, G.M.V.C.,
Veterinary Officer,

and

A. H. KHAN, G.V.Sc.,
Assistant Veterinary Surgeon,
Civil Veterinary Hospital, Narayanaguda, Hyderabad-Dn.

Phenamidine, a preparation of May & Baker's, very kindly supplied by the manufacturers for trial, has been used in many cases of *B. canis* in this hospital for the last two years. The drug has been used on nearly fifty cases and a few of them are published here for the information of the profession.

The dose was calculated at the rate of 1.3 c.c. for every 10 lbs. body weight.

1. O. P. No. 5682. 8-9-47. A terrier dog, aged six months, weight 8 lbs. Animal dull with a temperature of 104°F. Blood smears showed *B. canis*. Next day the temperature was 102°F. but it rose to 103.4°F. on the third day, when one dose of 1 c.c. of Phenamidine was injected. The day after the injection, the temperature dropped to 101.4°F. and the animal became active and was reported to have become his old self again.

2. O. P. No. 391. 19-10-47. A Fox-terrier male, aged two years, weight 12 lbs. Temperature 103.4°F. Blood smears positive for *B. canis*. The patient turned up after 3 days when the temperature was 104°F. A dose of 1.5 c.c. of Phenamidine was injected. The next day, the temperature was 103.2°F. and the subsequent day 102.4°F. A subsequent examination of the blood smears showed them to be negative for any parasite.

3. O. P. No. 1168. 29-11-47. A Terrier bitch, aged three years, weighing 32 lbs. Temperature 100.8°F. Blood smears positive for *B. canis*. A dose of Phenamidine 4 c.c. was injected. Next day the temperature was 100°F. and the blood smears were negative.

4. O. P. No. 3391. 29-5-47. A Terrier male, aged 8 months, weighing 6 lbs. Temperature 103.6°F. Blood smears were positive for *B. canis*. Next day a dose of .7 c.c. of Phenamidine was injected and the temperature dropped to 102°F. after 24 hours. The Pup became bright and active.

5. O. P. No. 2043. 5-4-47. A Great Dane, male, one year. Temperature 104°F. Blood smears positive for *B. canis*. Phenamidine 5 c.c. was injected. Next day, the blood smears were negative and the dog became his normal self.

6. O. P. No. 82. 15-6-47. A cocker spaniel bitch. Temperature 105°F. The blood smears were positive for *B. canis*. Phenamidine 2.6 c.c. was injected. The next day temperature dropped to 101°F. but the bitch developed Rabies and died after a couple of days. The examination of the brain was positive for Rabies.

In conclusion, we wish to point out that Phenamidine supplied as it is, is a very simple drug to handle, that it has given good results without any untoward effect. Sometimes, the injection was repeated after 5 or 6 days. After the injection there was an immediate response by way of drop in the temperature and in general brightness and activity of the animal. We have occasionally met with some relapses after a month, in all probability this was due to reinfection. In such cases we gave a dose of Phenamidine followed 4 days later with a course of Acetylarsan 2 c.c. on alternate days. This has given us good results not only in preventing another relapse but also in toning up the patient very rapidly.

We are very thankful to Dr. K. Raghavachari, the Veterinary Investigation Officer and his assistant Dr. Jatker for the examination of all the slides sent from us and also for their valuable guidance. We are also thankful to our Director, Dr. Mahamadullah for his warm interest in this work.

INTERCOSTAL ABSCESS IN BOVINES

By

IFTIKHARUDDIN AHMED, G.B.V.C.,
*Officer In Charge, Veterinary Hospital,
 Gulbarga, Hyderabad-Dn.*

An aged Deoni bullock was admitted in this hospital as an In-patient with the following history:—Dull and depressed for nearly three weeks, running down in condition, inappetence, suspension of rumination, paroxysms of cough and foetid odour from the mouth.

On examination, a tense swelling, nearly 15 inches in circumference was noticed on the left side of the chest, close to the point of the elbow. The swelling was fluctuating. Evidently, the formation of this abscess was the cause of the illness and as the lesion was ripe, it was decided to operate at once. With due precautions, a trocar and cannula was passed into the swelling and a large quantity—about 3 to 4 pints—of pus was removed. While removing the pus and cleaning the cavity, a grating sound was heard inside. Suspecting a foreign body, the cavity was opened out by a free incision, and an umbrella rib $4\frac{1}{2}$ " long was removed.

The wound was dressed antiseptically and the patient was given a Cardiac tonic and stimulant internally. The wound healed up and the animal felt relief within a short time.

A second case was met with in a buffalo with the symptoms and history mentioned above. But in this animal the swelling was not on the left but on the right side. This was also operated and an ordinary needle 3" long was removed. The wound was dressed as usual and the animal recovered within a short period.

Remarks.—It is opined, that in both the above cases, the foreign bodies must have been swallowed by the animals along with the feed and then migrated from the reticulum the chest wall without injuring either the heart or the pericardium.

INTERCOSTAL ABSCESS IN A BOVINE

By

M. P. C. Row,

Assistant Veterinary Surgeon, Jalna, Hyderabad-Dn.

On 3-5-48, a cow was admitted into the hospital with a tense swelling on the chest wall behind the right elbow. There was no visible marks of external injury. The swelling was neither well defined nor soft. Treating it as an immature abscess, Unguentum Iodine was applied daily up

to 8-5-48. On the 9th May, the swelling was proved to be crepitating but well defined. It was therefore immediately opened out. The contents were mostly gas with only a small quantity of pus. On exploring the cavity, a needle 3.5" long was found embedded. It was carefully removed and the part dressed antiseptically. Healing took place without any complications.

CASTRATION OF A BAR

By

B. S. P. RAO, G.M.V.C.,
*Veterinary Officer,
 and*

A. H. KHAN, G.V.Sc.,

Assistant Veterinary Surgeon, Narayanaguda, Hyderabad-Dn.

On 26-2-48, a juggler brought a bear and desired to have it castrated, as it was getting very ferocious.

Operation technique.—The animal was secured with strong ropes in the following way:—The mouth was muzzled with a strong rope. The front limbs were tied together and then they were tied to a tree. Two ropes were tied to each of the hind limbs and held by assistants. The animal was fixed in the dorsal position. The hairs in the region of the peritoneum and scrotum were clipped and site of the operation was painted with Tr. of Iodine. Planocain (M & B) was injected as a local anaesthetic. With an incision 2" long along the median raphe of the scrotum the testicles were removed after tightening the cords with catguts. The scrotal wounds were sutured and the part dressed with Cibazol powder and bandaged.

Healing took place by first intentions and the animal was discharged cured after ten days.

SUB-CONJUNCTIVAL ABSCESES IN CALVES IN
CUDDAPPAH DISTRICT*

By

P. L. NARAYANA RAO, B.V.Sc.,
Veterinary Assistant Surgeon, Cuddappah.

My purpose in reading this note is to draw the attention of my colleagues to a surgical condition that is most commonly met with in our practice in this district.

*Paper read at the Annual District Veterinary Conference 1947.

Sub-conjunctival abscesses are mostly observed on young calves of either sex, below 6 months of age, more especially in young buffalo calves. I am yet to find a case of this kind in adult animals.

Etiology.—The cause of this condition is not exactly known. All the various causes that bring about conjunctivitis, like irritants, foreign bodies, and flies, act as pre-disposing factors. A more probable factor is avitaminosis. Vitamin A is, as is well known, a protective vitamin and its absence may render infection easy. There might also be a congenital predisposition.

Most of the animals brought for treatment have a similar history. The complaint starts with acute conjunctivitis and purulent lachrymation. This naturally attracts flies. The flies may mechanically carry pyogenic organisms which are ubiquitous in nature. Wooldridge in his Encyclopaedia states that "on a normal conjunctiva a considerable variety of micro-organisms may be found in small numbers". Hence it is not even necessary for the organisms to be carried. These organisms may be termed 'Commensals', and, when one or more of the predisposing causes operate, may become more virulent and set up a pyogenic infection. In Wooldridge's Encyclopaedia of Veterinary Medicine, regarding the predisposing causes of squamous-celled Carcinoma of the eye, Woodruff says: "In other cases, irritation by flies and by sand may be a factor for these growths, and they are much more common in countries where these factors operate". It is a common knowledge that these factors operate in full in this district. Recently a buffalo-heifer calf, 3 months old, with sub-conjunctival abscesses on both the eyelids was brought to the hospital with the history that it had conjunctivitis to start with and that it was pecked by a crow. A week after, the calf developed the abscesses. I am afraid that in this instance, the crow would not only have injured the conjunctiva in its act of pecking but also would have acted as a mechanical carrier of infection.

Further, regarding the reason for the high incidence of abscesses in this region, Woodruff says that close to the free margin of the eye-lids the membrane is bound tightly down to the underlying dense fibrous layer of the eye-lid known as 'Tarsus'. Behind the Tarsus, the epithelium is thicker and more loosely held so as to allow greater freedom of movement. The underlying tissue is highly vascular and consists of loose lymphoid tissue. From the above it could be seen that this part of the conjunctiva is a favourable medium for the development of Pyogenic organisms.

Symptoms.—Depending on the location of the abscess, the affected eye lid is highly swollen, but is not always tender and painful. The eye ball recedes in and bulges the opposite eyelid. For instance, if the lower eye lid is affected, the eye ball is seen bulging the upper eye lid. There is

a temporary ectropion and the exposed conjunctiva is usually injected and in some cases covered with muco-purulent discharge. This disappears, when the abscess is opened and the condition is relieved. Rarely when both the eye lids of both the eyes are affected, the animal is temporarily rendered blind. Usually there is not much systemic disturbance.

Treatment.—Treatment is surgical. The abscess is opened out by incising through the skin of the eye lid carefully. After opening the abscess, the usual post operative treatment that is adopted for an abscess is followed except that no irritant antiseptics are used. Usually a retention suture is put as, otherwise in the fly season, there is a likelihood of the wound being infected with maggots. The part usually heals up in ten to fifteen days. Needless to say that the accompanying conjunctivitis also should be treated.

A Discussion on the paper then followed and it was initiated by Mr. M. S. Anthony. He incriminated the flies in the incidence of this disease as the cases were seen some time after the monsoon when the fly nuisance was at its worst. He agreed with the author of the paper that only young calves and that too mostly buffalo calves were affected.

Mr. Srinivasa Rao wanted to know whether there was any relationship between this condition and the other condition known as Sty. He also wanted to know why there was such a large incidence in Cuddappah district, as compared with Anantapur which is also notorious for the fly nuisance and sand storms.

Mr. Lakshmana Rao speaking next said that he encountered the cases mostly in buffalo calves, especially in those with a history of having returned from the Reserve Forest after grazing. He also admitted that only young calves were affected. Since they returned after a stay in the forest area, he attributed the condition to 'thorns' and 'pollens'.

Mr. M. V. Chalapathi Rao wondered how Mr. Lakshmana Rao could blame the pollen and thorns for the condition as the buffalo calves, especially young ones, were not sent to reserve forest at all.

The President Mr. S. Jacob, joined the discussion and said that he agreed with the author about congenital predispositions of calves to this complaint. In his view, apart from the common belief also, *Stomoxys* flies had something to do with this disease. Mr. Srinivasa Rao may be correct when he said that Anantapur had more flies, but the flies there were mostly *Musca domestica*. But, in this case, *Stomoxys*, a biting fly, was responsible and Cuddappah district abounds in it. It is well known that in this district Agricultural Pests Act is in force to reduce the number of *Stomoxys* flies that cause great damage to cattle. He pointed out that calves were mostly affected because they did not have strong eyelids and

eye-lashes to protect themselves from the flies. In conclusion, he said that he would suggest to the author to draw up a questionnaire on the disease so that all the Veterinary Assistant Surgeons in the district could study the problems and pool their experience and resources to tackle this problem which appears to be very common in Cuddappah District.

Mr. P. L. Narayana Rao, the author of the paper, replying to the discussion thanked Mr. Anthony for pointing out that the incidence of the condition was due to the flies. That was also the point he had been driving at. Answering Mr. Srinivasa Rao, he said that as far as he could gather, he did not feel that sty and sub-conjunctival abscess were similar. A sty was localised suppuration in the follicles of the eyelash whereas a sub-conjunctival abscess was under the conjunctiva. He said that very few districts could beat Cuddappah in the matter of fly nuisance and sand and dust storms. It was common experience that sand storms and heavy gales are met with in the hot months of the year. Even if these factors operated elsewhere he felt that, as this was an instance of pyogenic infection, there could be other causes operating simultaneously to produce the condition. The predisposing and exciting causes, though one or two of them were present elsewhere, may not operate to the same extent as they were operating in this district. Besides, he said that there was a congenital predisposition especially in buffalo-calves. This may not be operating in other places.

Coming to Mr. Lakshman Rao's point, he felt, that it was answered by Mr. Chalpathi Rao. It was unusual for buffaloes to be sent to Reserve Forest Area and much more unusual for buffalo calves. If there were any incidence in calves returning from the forest area, he felt it was mostly due to the fly nuisance which was at its highest in the interiors of forest. Also he said that the pollen and thorns that might get attached to the lids might predispose to the condition. He finally agreed with the President that all the Veterinary Assistant Surgeons should work on this condition in all its aspects. He thanked the President Mr. S. Jacob for suggesting him the subject for his study.

CAPONISING BY STILBOESTROL IMPLANT

BY

S. R. NADGIR, G.B.V.C.,

Officer-in-charge, Ranikhet Disease Vaccine Laboratory, Poona.

Caponising of birds is generally done by the removal of the testes through a flank incision and is best done when the birds are six to eight weeks old.

Another method of caponisation that is advocated is by the implantation of an Oestrogen tablet into the muscles of the bird. This can be done at any age. As an experimental measure 5 birds were caponised by this method and the results have been found to be satisfactory.

Technique.—The site of operation is the elbow region, where the muscles are thick. The feathers in this region are plucked and the part is painted with iodine. A small incision 3/8" is made on the skin and on the underlying muscles. A tablet of one mg. of Clinestrol—Stilboestrol (Glaxo) (half of this to the younger ones) is inserted into the muscles by means of a forceps. The muscles and skin are sutured with silk. The wound is dressed with Tr. Iodine. There is no after care and the wound heals up in a week's time.

The following are the details of the birds operated.—

Bird	Breed	Age	Dose	Date of operation	Date re-examined	Condition of feathers	Remarks
Cock	Rir and Desi cross.	13 months	1 mg.	30-11-46	11-2-47	Well grown.	Looks fatty but is not heavy to the size. Not mounting on hens.
Cockrel	"	3 months	½ mg.	30-11-46	"	"	Has put on flesh
"	"	"	½ mg.	30-11-46	Died.	Well grown.	No inclination to mount.
Cock	Desi	9 months	½ mg.	23-12-46	11-2-47	"	Put on flesh. No inclination to mount.
Cockrel	"	3 months	½ mg.	23-12-46	11-2-47	Well grown	Put on flesh.

My thanks are due to Mr. Mohey Deen, Ex-Director of Veterinary Services, Bombay Presidency for suggesting to me this method.

The implant of the Stilboestrol need not necessarily be intramuscular. Subcutaneous implants are reported to be effective—*Ed. I.V.J.*

A CASE OF PYLORIC OBSTRUCTION IN A DOG

BY

CAPT. S. B. V. RAO,

Poultry Development Officer, Hebbal Farm, Bangalore.

The subject of this case was an Alsatian dog weighing about 75 lbs. The history was that it had refused food for nearly 36 hours and that it was very excited. A dose of castor oil had been given by the owner but it made the dog violently sick. On examination paroxysms of howling followed by violent retching were observed. During these paroxysms the pupils became dilated and the eyes blood shot. The dog would then become ferocious and would go with bared fangs even for the owner. There was profuse salivation and motions were mixed with blood and mucus. The flanks were hollow and the animal resented palpation of the abdomen which was kept very tense.

A suspicion of rabies arose but the lucid intervals between the paroxysms suggested obstructive colic. There was also a history that the dog was in the habit of playing with stones.

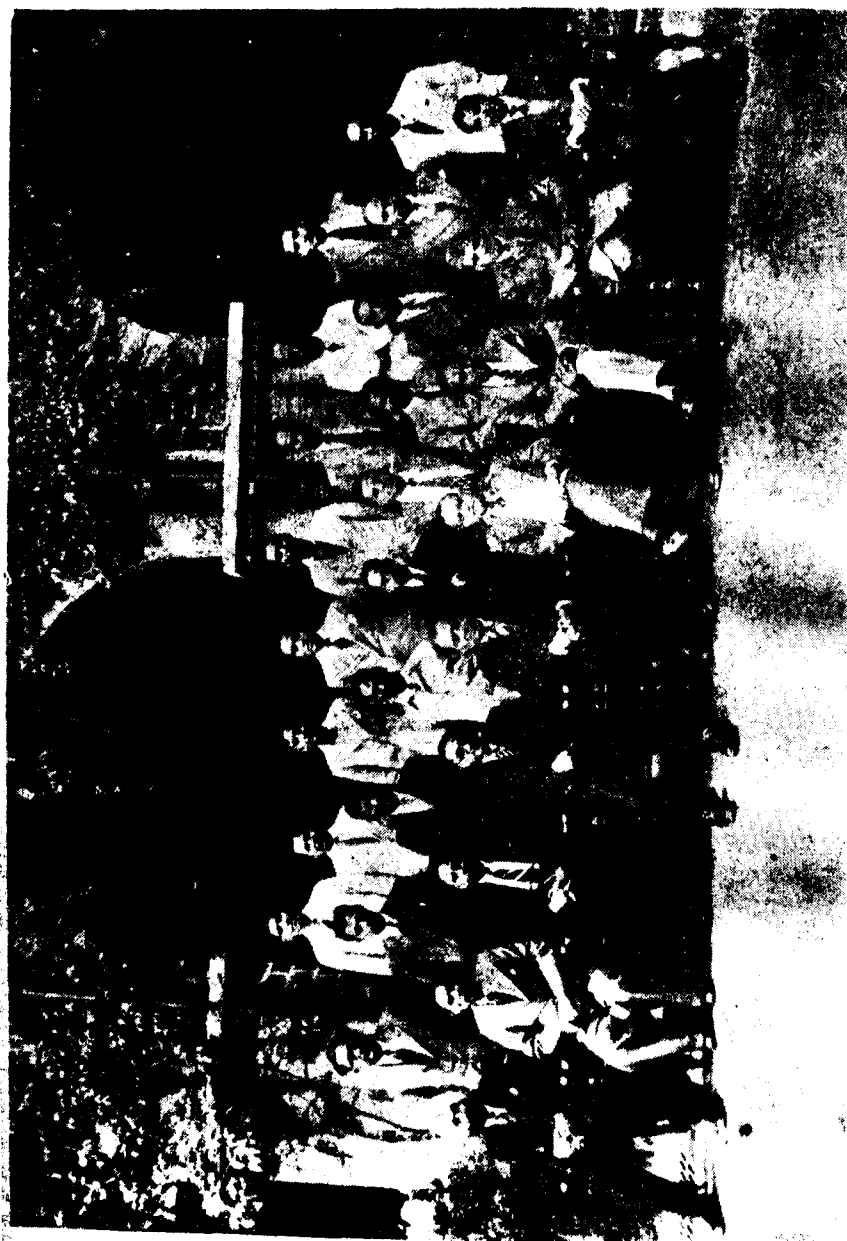
A skiagram was taken and a foreign body was located in the pyloric region.

Operative measures were immediately undertaken. The dog was anaesthetised with 'Intraval Sodium' (May & Baker's). The site of operation was thoroughly sterilised and an incision 3" long, below the xiphoid cartilage, was made in the mid-line through the linea alba and the abdomen entered. With a powerful beam of light directed in (the operation was done at night) the stomach was picked up between the gloved fingers, brought outside the abdominal wall on to the sterilised fabric and gripped between two rubber-covered vulcellum forceps at either ends. An irregular hard body as big, and shaped not unlike a duck's egg, was felt firmly wedged in the pylorus, the bigger end lying in the stomach.

A linear incision 2½" long was made along the longitudinal axis of the pyloric part of the stomach and an irregular-surfaced dark-stained, granite, was gently coaxed out and removed by forceps. The area of impaction was very much congested with some minor haemorrhages. The edges of the incision were cleansed antiseptically and closed with Lembert sutures. The stomach was carefully returned to the abdomen, and the laparotomy wound was stitched up as usual and sealed with methylated collodion. An abdominal bandage with plenty of cotton wool completed the operation, and the dog was allowed to recover from the anaesthetic, which it did after three hours. The post operative period was uneventful and the sutures were removed after ten days.



A CASE OF PYLORIC OBSTRUCTION IN A DOG



LEFT TO RIGHT

1st Row:—Shri. Sardar Gian Singh, N. C. Sen, M. K. Shrinivasan, V. R. Rajagopalan, Dr. S. Datta, (Director),
Dr. H. N. Ray, Dr. N. B. Das, B. N. Soni, J. M. Lal, J. S. Gupta (U.P.),
2nd Row:—S. N. Nandi (Bengal), L. D. Digraikar (Baroda), A. B. Shankar, (Hydrabad Deccan.), C. W. Broach, (U.P.),
U. R. K. A. Rao, (Agra), B. L. Purohit (Bombay), K. P. C. Nair (Madras),
S. C. Dubey (Rampur), S. C. Alagaratnam (Ceylon),
3rd Row:—K. N. Mahapatra (Orissa), D. K. Kohli (Orissa), D. N. Chatterjee (Bihar), H. C. Prasad (Bihar),
S. P. Phadke, (Bombay), E. T. Chiniah (Ceylon), B. N. Verjee (Bengal).

A CLINICAL NOTE ON THE THERAPEUTIC VALUE OF SOME OF THE LATEST PATENT DRUGS *

By

V. RATHNASABAPATHY, B. V. SC.,
Madras Veterinary College.

1. Phenamidine.
2. Antrypol.
3. Mepacrine.
4. Penicillin.

1. *Phenamidine* :—Piroplasmosis in dogs is not an uncommon disease and may be caused either by *Babesia canis* or *Babesia gibsoni*.

As a result of the world war No. II, Acaprin, a Bayer preparation which was considered as a specific against piroplasmosis (*B. Canis*) became unavailable. We were on the look out for a suitable substitute and we have now got it in Phenamidine, which is a May and Baker product. Within a period of 2 years from 1—1—46 to 29—2—48 about 12 cases of which 10 microscopically and 2 clinically positive cases for *B. canis* have been treated in this College Hospital with this drug. The results were very satisfactory. Though the demonstration of the parasite under the microscope is the certain method of diagnosis, it is not uncommon that in cases of negative diagnosis through microscopical findings, positive results have been obtained by inoculation of the blood of affected animals into susceptible young dogs. Hence even in microscopically negative cases good results have been obtained, if they had been found clinically positive, by treatment with this drug.

The usual clinical symptoms are :—a sudden rise of body temperature to 103° F to 104.5° F. pale red or icteric mucous membrane, dullness, listlessness, staggering gait, slight accelerated respiration, frequent pulse and passage of deep yellow coloured faeces and urine. The fever may be continuous or irregularly intermittent. Total loss of appetite and emaciation are also characteristic of this disease.

The following cases are noteworthy :—Case 1. D. W., I.P. 3346. A white terrier pup aged about one month, admitted with the usual history of loss of appetite, dullness etc. The temperature was ranging between 102° F. to 102.5 F. It was diagnosed both clinically and microscopically as one of *Babesia canis* infection. Weight being 2 lbs and 9 ounces, @ 0.3 c.c. per kilogram body weight, 0.3 c.c. of phenamidine was given subcutaneously on 18—11—47. Blood smears were negative for *B. canis* on the subsequent day and the animal was discharged cured.

* Read at the monthly meeting of the Madras Veterinary Assistant Surgeons' Service Association—Madras District.

Case 2. D. W., I.P. 3092. Grey Terrier, cross bred dog, aged about 4 years admitted with an abscess on the lower jaw. The abscess was opened and treated in the usual way. But the temperature instead of coming down after the abscess was opened remained fluctuating. It was however positive for *B. canis* both microscopically and clinically. Its weight being 24 lbs. 3 c.c. of phenamidine was given sub-cutaneously which cured the dog completely.

Case 3. D. W., I.P. 1945. A 2 year old Alsatian dog weighing 33 lbs. had irregular intermittent fever. Blood smears revealed no organisms. But it was clinically positive for *B. canis* infection. Usual antepyrhetics and sulpha drugs did not bring down the temperature. It was given 4.5 c.c. of phenamidine and has responded to the treatment very well.

In all these cases there had been no serious local or systemic disturbances as a result of the treatment given with this drug and the prescribed dose has been found very satisfactory. The route of injection being the sub-cutaneous one, it is easy for administration. Generally one injection will suffice. No recurrence of the disease has been seen in all the treated cases. If repetition of treatment is needed, a second injection of phenamidine is not recommended. In such cases treatment is resorted to with Trypan blue—5 to 10 c.c. of a 1% solution intravenously depending upon the size of the dog.

2. *Antrypol*:—Surra in dogs is usually characterised by a periodical rise of temperature, reddening of the conjunctiva, swelling in the region of the head, throat and extremities and also in-co-ordination of movement. In some cases there is a bloody serous infiltration in the joints, keratitis and falling off of hairs. Though outbreaks of this disease in dogs are not uncommon, sporadic cases do occur widely in this Presidency.

An interesting case, which did not manifest the usual clinical symptoms of the disease was admitted into the college hospital on 7-10-47. It is a tan coloured cross bred 8 years old dog weighing about 35 lbs. When it was brought to the hospital it was showing swelling of both the hind limbs which had been present for four days, previously. It had the history that it was unable to climb up the stairs.

Preliminary examination revealed, oedema of both the hind limbs, sheath and scrotum. Conjunctival mucous membrane was pale. Temperature was 104° F and the pulse hard, frequent and small. Heart's action was accelerated. Respirations were almost normal. Abdomen was tense and bowels were slightly constipated.

Oedema of the hind limbs may occur in various affections, such as cardiac diseases, renal diseases etc. Auscultation of the heart revealed no morbid alterations in the cardiac sounds and examination of the

urine revealed no abnormalities. Consequently it was decided to examine a wet film of the blood of the dog and microscopical examination of the same revealed numerous trypanosomes. Faeces revealed a few ova of ancylostomes. Hence the following treatment was adopted.

7-10-47—0.5 gm. of antrypol, dissolved in 5 cc. of sterile distilled water to form a 10% solution was given intravenously into the external saphena vein after pressing out the oedematous infiltration in that region.

8-10-47—Temperature 103.2° F. The oedema was the same. Dog was listless and had no good appetite. Microscopical examination of blood revealed trypanosomes.

9-10-47—Temperature 100° F. Oedema from the sheath, scrotum and upper part of the hind limbs became reduced. The dog had moderately good appetite. Blood subjected to microscopical examination revealed no organisms. Red blood cell count showed 2.93 millions per c. m.m.

10-10-47—Temperature 100° F. Oedema had completely disappeared and the dog had good appetite. Blood revealed no organisms.

11-10-47—T. 100.2° F. The dog was apparently alright and alert. R. B. C. count 3.45 million per c.m. m.

13-10-47—A second injection of 0.5 gm. of antrypol in 5 c.c. sterile distilled water was given intravenously.

15-10-47—R.B.C. count was 3.84 million per c.m.m.

16-10-47 to 23-10-47—The dog was kept under observation. No other treatment was given and it was dewormed on the 24th inst., with carbon tetra-chlorethylene in capsules. Blood examination on 26th revealed no organisms.

From enquiries made, it was learnt that no other dog in the locality was affected and the case was only a sporadic one. The source of infection could not be traced.

The photos taken before and after treatment (Fig No. 1, 2 and 3) are self illustrative.



1. Side view
Before Treatment,

2. Back view
Before Treatment,

3. After Treatment,

The dog was examined two months later, i.e. on 6-12-47 and the disease did not show any tendency to recur, and the dog's blood was found still negative for trypanosomes. Biological test with the blood after recovery was not done, as the owner was in a hurry to take away the dog.

A similar case, O.P.-2800, a 3 year old dog was also treated successfully on 23-10-47 with .5 gm. of antrypol.

The usefulness of antrypol at a time when Nagonal (Bayer 205) is not available deserves appreciation.

3. *Mepacrine*:—In dealing with the canine fevers it is not uncommon, that we meet with some cases of non-specific fevers which do not respond to the drugs as sulpharsenol, N.A.B, phenamidine etc., used against protozoal infections. In such instances a correct record of the morning and evening temperatures and studying the temperature graph has been found very useful. By so doing we have come across a few cases which have shown regular periodicity in the occurrence of the fevers, the rise and fall occurring on alternate days. The use of mepacrine, an I.C.I. product, extensively used in malaria and periodical fevers in human beings, has proved very valuable in the treatment of such cases.

The following cases are note-worthy.

Case No. 1. D.W., I.P. 652. A tan coloured Irish Setter dog, aged about 2½ years was admitted on 16-5-47 with the history that the dog was not able to bark and the hairs are falling off.

On admission the temperature was 104.4° F, there was discharge from the nostrils and mouth was clammy. Auscultation of the lungs showed congestion of both the lungs. Blood smears when examined revealed *Hepatazoon canis* and faeces showed a few ova of ancylostomes. The following treatment was adopted.

16-5-47 to 8-6-47 — Treatment for lung complaint with Cibazol & expectorant mixtures. Inhalation with Eucalyptus oil, warm clothing and all the other nursing details were attended to. The temperature came down and continued to be normal for some time. Appetite gradually improved. It was dewormed with tetrachlorethylene in capsules on 27-5-47.

9-6-47 — Temperature 102.8° F.	Sodii salicylas mixture was given Stimulant mixture was given since the animal was weak.
10-6-47 — " 106.6° F.	
11-6-47 — " 104° F.	

12-6-47 — Temperature 106.4° F. .6 c.gm of sulpharsenol dissolved in 5 cc. of distilled water was given intra-venously besides antepyrctic powders orally.

13-6-47 — T 102.8° F. Antepyrctic powders were repeated.

14-6-47 — T. 106° F. Smears were positive for *H. Canis*. Repeated the powders.

15-6-47 — T. 104.8° F. Repeated the powders.

16-6-47 — T. 104.8° F — 0.01 5 gm. of Urea Stibamine was given intravenously, dissolved in 3 cc. of distilled water. This was used as a curative against *Hepatazoon canis*.

17-6-47 — Urinary antiseptics and sedatives were administered to treat the kidneys since there was 0.4% albumin in the urine. T. 105.8° F.

18-6-47 — T. 101.4° F. The mixture for kidneys was repeated; smears revealed *H. canis*.

19-6-47 — T. 106° F. A second injection of Urea Stibamine 0.015 gm. was given intravenously.

20-6-47 — T. 102° F. Smears revealed only a few *H. Canis*. The mixture was repeated.

21-6-47 — T. 105.2° F. Repeated the mixture.

22-6-47 — T. 103° F. Repeated the mixture.

23-6-47 — T. 102.8° F. .02 gm. of Urea Stibamine was given intravenously.

24-6-47 to 26-6-47 — The kidney mixture was repeated daily. The temperatures were 105.4° F., 102.4° F and 105.8° F.

26-6-47 — The dog was very weak. 1 c.c. of Nuclein and 1 c.c. of Camphor in oil were given s/c. ½ tablet (0.05 gm) of mepacrine was given three times daily.

27-6-47 — T. 101.6° F. Mepacrine was repeated; smears were negative for *H. Canis*.

28-6-47 to 2-7-47 — Mepacrine was repeated. The temperatures were 104.4° F 101.8° F, 103° F. 102° F; & 102° F respectively, thus showing a gradual fall in the temperature and reaching the normal.

From 3-7-47 the temperature was normal and it was kept under observation till 28-7-47. During this period, it was given a course of iron tonics, chicken essence etc, to improve the condition and was discharged cured on 28-7-47.

4. *Penicillin*:—Penicillin is now widely used in all gram positive coccal infections with great success and has now replaced the sulphadiazine drugs to a very great extent.

A few trials as detailed below were conducted with this drug against pneumonia and cystitis in dogs with successful results in the Madras Veterinary College Hospital.

Pneumonia in a bitch:—D.W., I.P. 1379. A cocker spaniel bitch aged about 4 years was admitted with the usual history of dullness, loss of appetite etc. on 8—7—47. At the time of admission the temperature was 104.6° F. There was then watery discharge from the nostrils. The conjunctival mucous membrane was congested. Respiration was regular but hurried. Auscultation of the lungs revealed congestion on both the sides. Microscopical examination of blood revealed no organisms and of faeces showed a few ova of ancylostomes.

The following treatment was adopted. 8—7—47 to 10—7—47. Sulpha therapy with cibazol along with the usual expectorant mixtures, medicated inhalations and general nursing were resorted to; but no improvement was noticed and the temperature continued to persist. This indicated that there was no response to sulpha therapy.

10—7—47—Auscultation and percussion of the thorax revealed a small patch of consolidation in the right lung. This region was also tender.

Sulpha therapy was discontinued and treatment with penicillin was started.

The first injection of 20,000 units of penicillin was given intramuscularly in the region of the thighs at 11 A.M. on 10—7—47, and was repeated at 3 hourly intervals day and night till 2 P.M. on 12—7—47. On the whole 24 injections amounting to 4,80,000 units of penicillin were administered in the regions of the thigh muscles and shoulder muscles. The bitch had the usual stimulant expectorant mixture and nursing. In addition, 1 cc of nuclein was given daily to improve phagocytosis.

The patch in the lung cleared slowly and the temperature came down to normal gradually by the 15th and the animal was discharged cured on 24—7—47.

Cystitis in a bitch:—D.W., I.P. 45. A white Bull Terrier bitch aged about 3 years was admitted on 3—4—47 for cystitis. The urine was light red in colour, turbid in appearance and alkaline in reaction. Further examination revealed the presence of .01% of albumin, hemoglobin, tripple phosphates and pus cells. The bladder was irrigated with warm sterile 0.5% saline followed by 1% boric lotion, urinary antiseptics and sedatives were administered orally. This was continued till 20—4—47. There was no response to treatment. The urine was examined almost daily and it was showing pus cells in it throughout the period. bacteriological examination of urine revealed staphylococci.

20-4-47 — Penicillin therapy was started and the first dose of 10,000 units was given at 9-30 A.M. intramuscularly in the region of the thigh. This was repeated at three hourly intervals day and night till 9-30 A.M. On 21-4-47, the complete dose of 90,000 units had been given.

The usual urinary antiseptic and sedative mixture was given, pus cells were present in small numbers in the urine.

22-4-47 — Very few pus cells were observed in the urine. The mixture was repeated.

23-4-47—There was nothing unusual in the urine and it continued to be normal thereafter till 29-4-47, when it was discharged cured.

My thanks are due to Sri M. R. Subramanya Sastry, officer-in-charge of the Hospital, under whose guidance and help the above trials were conducted. My thanks are also due to Sri Vaidyanatha Mudaliar Principal of the college for permitting me to publish this article in the journal.

DISCUSSION

An interesting discussion ensued on the latest patent drugs referred to in the article and their utility in Veterinary practice although the author restricted his scope only to the canine practice. All the members present at the meeting partook in the discussion. It has been stated by the author during the discussion that Phenamidine has been found to be effective so far only to the infection of *Babesia Canis* and has been of no avail in the treatment of *B. gibsoni*. The author also revealed that biological tests were not conducted to prove the infection in all the cases that he has tried the drug and only clinical findings were the main criteria for coming at a conclusion of the type of infection. It has also been stated that Phenamidine need not be repeated if proper dosage is computed and one injection would suffice for an effective cure.

Discussion about the use of Antypol was restricted mainly to its dosage and its prophylactic use. The author stated that the dosage was computed not according to the weight of the animal but based on human posology. Mr. Soundararajulu speaking of his experiences of Endemic Surra in Assam in equines, stated that 0.4 grams per 100 lbs. body weight was administered as a prophylactic dose dissolved in 100 c.c. of normal saline or as a 10% solution in normal saline although the recommended dose was 0.5 gram per 100 lb. with the injections to be repeated once in 21 days to 28 days.

This mode of periodical injections was found to be definitely not a certain method of prophylaxis. In most cases it is stated, that during a stage after injection, the drug is present in the blood in an insufficient concentration. When infection occurs during this stage, the trypanosomes are stated to be exposed to the sub-lethal concentration, insufficient to arrest the multiplication of trypanosomes, eventually producing a type known

definitely to be "Antrypol fast". It has been found that such an infection is less amenable to treatment with Antrypol than fresh infection in animals not previously drugged with antrypol. Reinfection during a course of treatment with Antrypol, in most cases had been difficult to cure. Considering the above and the susceptibility of some of the animals even to slight doses, the speaker stated, that Antrypol is of no use as a prophylactic agent. The speaker also stated that when animals show nervous symptoms, treatment of any kind is of no avail. Intrathecal medication of Antrypol has not affected cure in equines. It has also been revealed that pyrexia is not a constant symptom of Surra in canines.

Although the pharmacology of mepacrine in chronic recurrent undulant fevers could not be specified, yet it has been pointed out that the drug was very useful in such cases as a last resort in an empirical manner.

Discussion on trials of penicillin in canine practice was mainly about its dosage and its efficacy in different infections. The dosage it has been pointed out was based on human posology, but even here the dosage was altered as per the nature of infection. No cutaneous lesions due to penicillin therapy were observed so far in the cases tried in the College. No detailed bacteriological examination could be furnished as to the nature of infection in all those cases and the significance of its utility in different infections could not be specified.

Since the author's intention was only to suggest some of the uses of these new drugs judged by his clinical experiences, the information furnished by him was considered to be of immense use to a practising Veterinarian for further trials.

Association News

THE BOMBAY VETERINARY MEDICAL ASSOCIATION.

ANNUAL CONFERENCE.

The President and the Managing Committee of the Bombay Veterinary Medical Association in their meeting held on August 13, 1948, have decided to convene the Annual General Conference of the Association during the last week of December 1948. The function includes reading of scientific papers and framing resolutions. Papers to be read and resolutions to be put before the General Body may therefore be sent to the Hony. Secretary, Bombay Veterinary Medical Association, Bombay Veterinary College, Parel, Bombay 12, so as to reach him before November 1, 1948, to facilitate their insertion in the Agenda.

Parel, Bombay 12, }
August, 21, 1948 }

S. G. KSHIRSOGAR,
M. R. REDKAR,
Hony. Secretaries.

U. P. ANIMAL HUSBANDRY STOCKMEN'S ASSOCIATION.

The Second Annual Conference will be held at Lucknow on the 10th and 11th October 1948. Members are requested to attend in large numbers and make the Conference a grand success.

Gabhana, Aligarh,
August 22, 1948. }

J. P. SAXENA,
General Secretary.

College News

BIHAR VETERINARY COLLEGE, PATNA.

The following students are declared to have passed the Diploma Examination (Supplementary) held in July.

1. Munshi Singh—U. P.
2. Biranchi Narain Sadangi—Orissa.
3. Chandeshwar Pd. Singh—U. P.

S. K. SEN., B.Sc., M.R.C.V.S.,
Secretary,
Board of Examiner,
Bihar Veterinary College, Patna.

BENGAL VETERINARY COLLEGE.

List of the students who have passed the Supplementary Diploma Examination of the Bengal Veterinary College during the session 1947-48.

Roll No. 29 A. P. Raghaban,	Roll No. 60 N. C. Chose,
33 D. K. Das Gupta,	61 R. K. Sen,
39 R. N. Saha,	62 P. R. Ghose,
51 L. M. Chatterjee,	74 M. K. Sen Gupta.
55 S. Kundu,	

THE EASTERN PAKISTAN VETERINARY COLLEGE.

The Director of Veterinary Services, East Bengal, has sent us the following information about the Eastern Pakistan Veterinary College for publication in the *Indian Veterinary Journal*.

Bengal depended upon the College at Calcutta which was established in the year 1893 for Veterinary studies, the Diploma course for veterinary Assistant Surgeons and the trainings of shorter duration for the subordinate personnel. The advent of the constitutional changes deprived East Bengal of the benefits of this Institution, and in spite of all the financial embarrassments,

the local Government could not ignore the dire need for Veterinary Education. Accordingly the matter was given a sympathetic consideration and the Eastern Pakistan Veterinary College was started straightaway. The College commenced functioning on November 7, 1947 and the sanction for its establishment was communicated to the Veterinary Directorate a few months later.

It was impossible to construct buildings and other structures for the institution at such a short notice. The College was therefore located at Comilla in buildings requisitioned for the purpose. The students of the College were in a similar manner housed in hired buildings close to their centre of education. Steps were also taken to build up a new Veterinary Hospital for facility of treatment, education and research. The research problems were allotted to the teaching staff and thus education and research were combined in terms of the recommendations of the Royal Commission on Agriculture. Facilities are also available at the College for Post-Graduate Training of Veterinary Staff and Veterinary Assistant Surgeons, in terms of Standing Orders of Government, were brought to the College for their Post-Graduate Studies prior to their promotions to higher ranks.

The Assets and Liabilities Committee of the Partition Council did not agree to any physical division of the assets of the College at Calcutta. The Eastern Pakistan Veterinary College had to start with a scratch and was brought to the standard of a first class centre for Veterinary education in the country. The Board of Examiners consisting of experts from all over Pakistan who conducted the Annual and Diploma Examinations during the 1947-48 Session thought highly of the standard of the College and recorded their appreciation in very eulogising terms. The College has been affiliated to the University of Dacca and the examinations of the College were conducted by the University unlike the practice in vogue in the Veterinary College at Calcutta.

It is proposed to introduce B.Sc. and M.Sc. and other advanced courses in Veterinary and Animal Husbandry Sciences at the Eastern Pakistan Veterinary College in the near future.

In spite of its short life the College has made a name. Even during the first session students from other parts of the country and the Indian Dominion sought admission into the College and a large number is expected to come from other countries and other parts of Pakistan hereafter. The Institution welcomes boys keen for Veterinary studies from all over the world.

There is also the Central Pakistan Veterinary Research Institute and the Provincial Poultry Research Centre close to the College where students are allowed all facilities for practical demonstrations and training. The local Government not only attend to the routine requirements of the College but there are stipends generously provided for the poor and deserving students. Besides there are prizes and medals awarded on the results of the Examinations

to meritorious scholars. There are also stipends awarded by the District Boards and other Local Bodies to the students of the Eastern Pakistan Veterinary College.

The Eastern Pakistan Veterinary College is entirely a Government Institution and its staff consists of a Principal, Vice-Principal, Professors, Lecturers, Assistant Lecturers, House Surgeons, Curator and Librarian, Gymnasium Instructor, Farrier, Artist, a Riding Master and a considerable number of out-door workers. This staff is in addition to the officers and subordinate personnel employed for the Research Institute which functions with the College conjointly.

Correspondence

Royal College of Veterinary Surgeons,
9/10, Red Lion Square,
London, W.C.I.

12th July 1948.

Dear Editor,

I was very happy to receive your air mail letter of the 29th June, and to give you the information set out below.

At the moment the Veterinary Surgeons Bill, 1948, is before Parliament and will shortly become law. It will, it is anticipated, make marked changes in veterinary education in this country. As a result of this veterinary degrees of British Universities and post-graduate diplomas of such universities may be open to graduates of overseas universities. The position, however, at the moment, is that the Royal College is prepared to make the following concessions to persons desiring to take the M.R.C.V.S. diploma:—

- (a) That the holders of veterinary degrees of the Universities of Madras, Lahore, Bombay, Agra (U.P.) and Nagpur (C.P.), be required to take the Final Examination, plus one extra subject, after the minimum of two years' attendance at an affiliated veterinary school.
- (b) That the holders of the diplomas of Madras and Lahore Veterinary Colleges (G.M.V.C. and L.V.P.), if in possession of an Inter B.Sc., be given exemption from the first professional examination.
- (c) That no exemption be granted to the holders of any other Indian or Pakistan veterinary degrees or diplomas.

I must emphasise that these concessions are given as a general guide to applicants and that every application is judged on its individual merits.

Yours faithfully,
W. G. R. OATES,
Registrar.

Asthma in a Pomeranian Bitch

Sir,

With reference to the article on the above subject in Vol. XXIV, No. 5, March 1948 issue of this journal, I wish to say that some such cases have been successfully treated by Auto-haemotherapy i.e. starting with $\frac{1}{2}$ c.c. of the patient's own blood injected intramuscularly every fourth day, increasing the dosage by $\frac{1}{2}$ c.c.

4th May, 1948.

B. S. P. RAO, G.M.V.C.
Narayanaguda Hyderabad-Dn.

Extract

Canine Heart Diseases.—BY WILLIAM J. LENTZ, V.M.D. University of Pennsylvania Bulletin No. 109 January 1948.

THE NORMAL HEART

The heart of the dog is almost globular in outline. Its weight averages 1 per cent of the body weight. The sounds of the heart are two in number; "lub" and "dub". The first sound is formed partly by the muscle sound of the contracting ventricles, and partly by the tension of the auricular-ventricular valves; the second is produced entirely by the closure-tension of the aortic and pulmonary valves. Cardiac systole extends from the commencement of the first sound to the commencement of the second sound; diastole from the commencement of the second sound to the commencement of the first. The systolic interval is shorter than the diastolic; the first sound is of longer duration and of less tension than the second.

The veterinarian has labored under a handicap in the diagnosis of heart conditions in the dog because he has not applied to any appreciable extent the physician's technique. The physician makes use of certain auscultation areas where the individual valve sounds are best conducted. In the small animal it is difficult to investigate the sound generated by a particular valve because the cardiac valves are grouped together within a very small area. Furthermore, he has not made use of such diagnostic appliances as the electrocardiograph, and other heart-recording instruments. The three-way test, so-called, which is so useful in the diagnosis of cardiac conditions in humans is difficult of application in small animal practice. This searching test requires the use of the cardioscope, electro-cardiograph, and stethoscope. At educational and research institutions, the electro-cardiograph has been used to advantage in the diagnosis of such simple conditions as partial heart blocks, auricular fibrillation and other heart diseases in the dog.

The cardiac impulse can be felt in the majority of healthy animals as a circumscribed systolic thrust, causing the left ventricular wall to come in

contact with the chest wall. It can be ascertained best when the flat of the hand is held over the cardiac region, usually at a point corresponding to the fifth intercostal space. It normally should not occupy a greater area than one-half square inch. Both cardiac hypertrophy and dilatation produce an increase in the area of the cardiac impulse; but in the former case, the thrust is heaving and powerful, whereas in the latter instance, it is weak, indeterminate, and diffuse.

Percussion is of doubtful diagnostic value in the small animal with the possible exception of hydropericardium. X-ray examinations on the other hand, are often of great importance in the diagnosis of such conditions as cardiopneumosis, hypertrophy, dilatation, hydro-pericardium, adhesions, etc.

MEMORANDA ON THE CLINICAL PATHOLOGY OF THE CIRCULATORY APPARATUS

Owing to a well-recognized reserve power, the accommodation of the heart muscle to the demands made upon it is very complete in health.

Great and continued expenditure of force is followed by hypertrophy of tissue, just as in the skeletal muscles. Any obstruction to the circulation, either in kidneys, liver, lungs, or blood vessels, puts a strain upon the heart which may cause hypertrophy of the organ. Dilatation of the heart may follow severe heart fatigue. This condition is sometimes seen in fox hounds, or in dogs, the owners of which, laboring under a misapprehension that a lot of exercise is good for the animals, require them to follow their car, often for long distances and at too great a speed. A heart may be permanently damaged in this way.

Chronic degeneration of the heart muscle may result from infectious fevers, such as distemper. A dilatation of the heart brings about a reduction in its tone and power and is first made manifest in functional disturbance in the lungs, liver, kidneys, and other organs. A moderate valvular defect is important because it concerns accommodation, but a dilatation has a serious pathological significance.

Venous stasis gives a well-recognized clinical picture of heart disease. Cyanosis, with or without pulsation of the jugular veins, cardiac dyspnoea and hyperemia of the liver and lungs with fluid accumulations in dependent parts and cavities are parts of this picture. The size of the liver and its tenderness are important guides to the degree of the condition. A complicating hydrothorax is often present and overlooked. The removal of fluid from the thorax is sometimes beneficial in a venous stasis.

Hypertrophy and Dilatation:—Enlargement of the heart may be due to simple hypertrophy or to dilatation, or to hypertrophy and dilatation combined. Simple hypertrophy of the heart is the direct result of heart strain on a heart muscle not markedly degenerated. It is frequently secondary to nephritis,

hepatitis, emphysema, valvular defects, atheromatous vessels, etc. In fact, any chronic obstruction to the circulation is followed by primary hypertrophy which influences heart function and ends in dilatation. The pulse is full, strong, and of high tension in cardiac hypertrophy, whereas, in dilatation, it is small, weak, quick and intermittent. Two varieties of cardiac dilatation are recognized, dilatation with thickening and dilatation with thinning of the heart walls. Hearts which have lost their tone from muscular degeneration (often resulting from infectious fevers) are apt to dilate if subjected to severe strain. Dilatation is the opposite of hypertrophy and causes heart weakness. One of the earlier signs of dilatation is an irregular and intermittent pulse. Sometimes embryocardia, or gallop rhythm, may be heard on auscultation.

Endocarditis:—This is an inflammation of the inner lining membrane of the heart. Any infectious disease may constitute the causative factor. The condition may be acute or chronic.

Bacteria find a foothold on the endocardium, usually in the left heart, and the ensuing hyperplasia, or destructive inflammatory process is very apt to result in permanent damage to the valves. Some types of endocarditis have the cardiac or cerebrospinal symptoms pronounced. Jaundice has been observed. Short breathing and great restlessness is a prominent feature in the acute form which sometimes follows septicemia, parturition fever, distemper, etc. The disease frequently terminates fatally.

Chronic endocarditis is a slow, insidious process. It is secondary to the acute form, or superinduced by various irritants and infections, together with prolonged muscular strain. This process causes thickening and contraction of valves, usually in the left heart.

Pericarditis:—Pericarditis is usually secondary to an inflammatory process of the pleurae. It may be dry, or marked by serous or purulent effusion. Dry pericarditis is recognized principally by its friction sound, a to and fro sound, corresponding to systole and diastole of the heart. Pericarditis with effusion may develop without characteristic signs, although manifestation of pain on pressure over the heart, and dyspnoea may be present.

From pressure upon the trachea and esophagus there may be cough, difficulty in swallowing, and venous stasis. Pericarditis is often overlooked or mistaken for pleurisy. In fact, it is sometimes extremely difficult to distinguish between the two. The heartbeat can be plainly heard when the effusion is strictly limited to the pleurae, but it can hardly be detected when the effusion is in the pericardial sac. Pleuritis and pericarditis may co-exist. Pericardicentesis is sometimes indicated, also pilocarpine, digitalis, or caffeine.

Hydropericardium:—A non-inflammatory, passive effusion of serous fluid into the pericardial sac is called hydropericardium. This condition is usually associated with hydrothorax and often with ascites and anasarca. In the dog, it usually develops through local stasis of the circulation due to valvular lesions.

Cardioptosis, Hypertrophy, Dilatation, Fat Laden Heart:—All these conditions are common in the old dog. Old dogs also suffer from weak heart and flabby heart. Weak heart from cardioptosis is due to a relaxation of the elastic tissue of the large vessels which allows the heart to hang much lower in the thorax than normal. Fat Laden heart is the fatty infiltration of the heart muscle.

Significance of Alteration in the Cardiac Sounds:—In health, the cardiac rhythm in humans should be regular even though the rate is generally accelerated by exercise and under excitation. In the dog, however, the rhythm may be habitually irregular without necessarily indicating any pathological condition.

In the small animal it is practically impossible to differentiate the various heart bruits. For example, in listening to the heart during an attack of palpitation brought on by excitement, one finds that all murmurs are indistinct, but reappear after the heart is quieted. The first sound is partly generated in the ventricular muscles. In hypertrophy, it may be described as low pitched and muffled. When, however, the hypertrophied ventricle is beginning to be unequal to the strain imposed upon it, the first sound at first becomes rather indistinct; when there is a distinct dilatation, the muscle-sound appears to be lost, and the first sound becomes short and sharp like an ordinary second sound.

The short, sharp first sound of mitral stenosis is not due to ventricular dilatation, but to the forcible contraction of the left ventricle before it is completely filled. A reduplication of the first sound is taken to mean asynchronism of the two ventricles, with the result that the tricuspid and mitral valves do not become tense at the same time.

Intermission of the first sound every few beats may occur in the dog as a constant feature in certain perfectly healthy hearts. Accentuation of the second sound indicates high pressure in the systemic or pulmonary arteries respectively; e.g., the ringing aortic second sound of chronic interstitial nephritis and the accentuated pulmonary second sound of mitral stenosis. In dilatation, the second sound gets shorter and weaker until, in some cases, it may be inaudible.

The spacing of the heart sounds may be altered in two ways. Systole may be prolonged at the expense of diastole until both are of equal length. This "tic-tac" rhythm, as it is called, suggests a heart which is no longer capable of dealing with some increased strain to which it is being subjected. It occurs sometimes when the limit of hypertrophy has been reached.

A "bruit" is any adventitious sound heard on auscultation. It embraces the so-called "murmurs" which are blowing, or rasping, sounds heard on auscultation. An endocardial sound or "murmur", may be defined as an endocardial sound produced at one of the valves of the heart. It is due either to an abnormal relationship between the valve and its neighboring structures, or to inflam-

mation of the connective tissue in the myocardium. In the latter case, there is produced a cardiac stenosis (constriction) of the ventricles either at the beginning of the pulmonary or the aortic openings with subsequent hindrance to the free passage of blood from the ventricles into its corresponding artery. When this condition exists the second sound is fully formed and sharply defined, thus distinguishing the condition from valvular stenosis. Animals suffering from toxic conditions, such as anemia, for instance, present so-called "functional murmurs", which are due to slight dilatation of the tricuspid, or mitral rings.

"Organic murmurs", so-called, result from structural deformity of the valves. Each valve may be affected in two ways: it may be obstructed or incompetent (valvular insufficiency), and so permit of regurgitation through its orifice. In many cases both incompetence and obstruction are present at the same time. The hissing, or blowing, type of bruits are found in association with valvular insufficiency (often present in filariasis), whereas, in stenosis, the sounds are shorter and sharper.

The Fat Laden Heart:—Fat dogs frequently present the clinical evidence of heart weakness. In all such cases, we should endeavor to distinguish between fatty degeneration and the fat laden heart of obesity. In other words, we must determine whether we are dealing with a fatty degeneration of the muscular fibers of the heart, or with an increase in the quantity of the subpericardial fat. In obesity and fat laden heart, much can be done by rational management. The obese individual is sluggish in its movements. It may have indigestion from mechanical interference with respiration and later on from true fatty infiltration of the heart muscle. The liver becomes large and fatty. Edema and eczema are often associated with this condition.

Treatment:—The first step in the treatment of this condition is the reduction of the amount of food and oxidation of the stored up fat; exercise is recommended, but must not be too violent. Thyroid desiccated tablets $\frac{1}{4}$ to 3 grains are prescribed once or more each day. Should palpitation and disturbance of cardiac rhythm be made manifest, the thyroid medication should be discontinued.

Chronic Degeneration of the Heart Muscle not due to Valvular Defects:—Various terms are used to designate such a condition, namely, senile heart, myocarditis, fatty degeneration, etc. Any acute infection, such as distemper, influenza-like infections, acute infectious intestinal fevers, etc., may be the starting point of the chronic inflammatory process in the heart muscle. Chronic infections, chronic intestinal putrefaction, toxemias, and over-exercise are frequent causes. In fact, any nutritional change which blocks up the blood supply of the heart may result in softening and degeneration of the heart walls. Pathologically, we observe induration, softening, hyaline, fatty and amyloid degeneration with general, or localized, dilatation. Clinically, it is impossible to distinguish one form of degeneration from the other as the symptoms are

alike. Some of the symptoms of muscular degeneration of whatever nature are indigestion, palpitation, epileptoid attacks, cold extremities, dropsy and weakness. The heart eventually dilates.

Prognosis is grave as the condition cannot be cured. The animal often dies suddenly. However, under careful management life may be prolonged for a long time.

The Senile Heart:—In some old dogs with a negative history of any antecedent disease, the heart is often found enlarged. An active or relative weakness of the myocardium is the origin of the symptoms of senile heart. These symptoms are weak cardiac impulse, cardiac throbbing, cardiac asthma (with and without exertion), loss of appetite, syncope, albuminuria. Senile diseases are always degenerative and tend to abridge the natural term of life. Our object, therefore, is to relieve symptoms and check decadence. Senile cardiac failure is based upon impaired metabolism.

Valvular Heart Disease:—A valvular defect is of accommodative importance. A derangement in the mechanism of the cardiac valves places an obstacle in the way of the outward flow of blood. To maintain the circulation under these conditions, the heart necessarily enlarges by hypertrophy of the myocardium. As a sequel, and to correct valvular insufficiency or obstruction, Nature furnishes us with compensatory hypertrophy of the heart muscle. However, muscular degeneration and dilatation manifest themselves earlier in a damaged heart than in a normal one.

The various valvular defects do not influence or disturb the circulation in a like manner.

SOME SIGNS AND SYMPTOMS OF VALVULAR LESIONS

Aortic Stenosis: A contraction of the aortic ring is known as aortic stenosis. The diagnosis will depend upon the history, aspect, age, and the absence or presence of concomitant symptoms. A loud murmur indicates strong ventricular action. In actual obstruction, there is cardiac hypertrophy and a deranged circulation; the pulse wave is long and slow and the pulse small. In actual obstruction of the aortic valve, the mitral valve may suffer severe strain and become incompetent. In ascertaining the presence of murmurs or bruits, the pulse should be taken simultaneously. Functional or hemic murmurs in this region (a sound believed to be due to changes in the quality or amount of the blood and not to lesions of the valves or vessels) are heard in anemia, in anemic individuals convalescent from acute illness, and in impaired flexibility of a valve without stenosis in middle age.

Aortic Insufficiency:—In this condition we are dealing with an "endocarditis," wherein a thickening and puckering of the aortic semilunar valve occurs. Endocarditis is perhaps the most frequent cause of valvular defects. If the inflammation persists, stenoses occur. Weakness of the heart muscles, dilatation, and anemia are also factors causing valvular deficiencies.

The pulse in this condition is of low tension and becomes irregular. There will be, in addition to hypertrophy, dilatation of the left ventricle. Other symptoms are distressed breathing, and sometimes syncopal attacks. Mitral regurgitation may co-exist. *Prognosis*: When the lesion is not due to degenerative changes in the heart, the animal may live for years depending on the age and the time of life when the lesion was acquired.

Mitral Insufficiency:—Mitral insufficiency is the result of an inflammation of the valve. Regurgitation in varying degree occurs. The pulse in this condition is usually irregular in rhythm and force. A musical murmur is sometimes heard. In severe, advanced cases, indigestion, dyspnoea, dropsy, and passive liver congestion are present. *Prognosis*: This is the least serious and the most amenable to treatment of all valvular lesions. Ascites, pulmonary and hepatic congestion and edema come and go.

Mitral Stenosis:—This is a serious form of heart disease. The pulse is usually of high tension and the heart enlarged. Other symptoms are distressed breathing on exertion, indigestion, a tendency to congestion of the lungs, and enlargement and pulsation of the liver. All forms of dropsy and congestive symptoms may be found.

Tricuspid Insufficiency:—Regurgitation, with or without a murmur, occurs and is usually due to back pressure in the lungs in valvular disease of the left ventricle. There is often, also, a passive congestion of vessels of the lungs. Sometimes the veins of the neck are distended and pulsate and the damming back of the blood in the posterior vena cava enlarges the liver to the point of pulsation.

Tricuspid Stenosis:—This is usually associated with mitral stenosis. The jugular veins are distended, but there is no pulsation. Dropsy occurs early.

Pulmonary Stenosis:—This is a congenital condition.

Prognosis and Treatment:—A cardiac murmur does not necessarily constitute a heart lesion. There are accidental and functional murmurs, such as appear in flabby, anemic and fatty animals, or in overworked hunting dogs, which disappear when the heart has regained its tone.

The treatment is practically the same in all valvular lesions. The cure of a heart ailment is not necessarily hopeless until potassium iodide has been tried. Vitamin E has been recommended in cardiac disease of small animals. N. H. Lambert of Ireland (Vet. Rec., 59, July 19, 1947: 355-356) cites apparent beneficial therapeutic results with Vitamin E in the treatment of cardiac and general debilitating conditions of aged dogs and cats. He recommends a usual dosage of a 3-mg. tablet three times a day for two or three weeks and less often for one to three or more months afterward. When compensation is broken, some symptoms, such as marked dyspnoea, dilated heart, marked irregularity of action and edema are made manifest. Cardio-renal affections often

result in conditions like anasarca, ascites, pulmonary edema, urinary edema (leukophlegmasia), etc. Generally speaking, cardiac dropsy is usually made manifest as a swelling of the subcutaneous tissue of the posterior limbs; renal, of the eyelids, face and neck.

Prognosis must be based on the merits of each individual case. Fresh air, sunshine, and restricted exercise are, of course, essential. A strictly carnivorous diet is called for, and to aid digestion and guard against tympany, or vomiting, dilute hydrochloric acid, tincture of cardamon, and pepsin may be given after meals.

Anemia is a prominent feature in many heart ailments. Some form of iron, such as the sulphate or liquid iron (Liq. ferro pepto manganese is indicated.)

Treatment of Cardiac Dropsy:—Either digitalis, stropanthus, or caffeine, calcium gluconate in large doses, and saline laxatives and diuretics are indicated. Xanthine compounds, such as caffeine, theobromine and theophylline, are useful diuretics, and are of particular value in congestive heart failure (myocardial insufficiency). They are usually ineffective however, when edema is due to extra-cardiac causes and are inferior in diuretic activity to the mercurial compounds. Hepatic congestion often is present and calls for a course of calomel.

Treatment of Cardiac Asthma:—Fluid extract digitalis, 1 dram, and tincture opium, 1 dram, one to two drops of this mixture every four hours, or morphine hypodermically, is prescribed. The dyspnoea of "asthma" of renal and cardiac disease, is not attended by the sonorous and piping rales and other physical signs of true asthma. Theobromine, theophylline, epinephrine, caffeine are useful in the clinical treatment of "bronchial asthma." Caffeine has long had a reputation for effectiveness of aminophylline (theophylline ethylenediamine) in "bronchial asthma" has been confirmed by a large number of physicians (Boyer, Norman H., J.A.M.A., Vol. 122, May 29th, 1943, p. 306.)

In cardiac edema or dropsy a diuretic is indicated. Mercurial diuretics seem to be the most effective in this condition. Aminophylline has a strong diuretic action. "Mercupurin", a combination of mercurin (a mercury preparation) and aminophylline is of value when the edema is due to cardiac decompensation, although less effective in edema when due to renal disease. The mercurial diuretics are sometimes of value, however, in chronic nephrosis and the nephrotic type of glomerulonephritis. Hypertonic glucose, or sucrose solutions, seem to give more favorable results when used in connection with kidney insufficiency. If the kidneys are only passive, or partly inactive, diuretics, such as digitalis may be employed to stimulate their secreting structure and to increase the leakage through them by increasing blood pressure. Sugar of milk is an active diuretic. Urea in 5 to 10 grams 2 to 4 times a day is sometimes beneficial in long standing cardiac edema, chronic nephrosis, and the nephrotic type

of glomerulonephrosis. It is contraindicated, however, when renal function is markedly impaired. Such animals should be placed on a milk diet—buttermilk, cottage cheese, junket—excluding other forms of nourishment.

Goodman and Gilman write in *The Pharmacological Basis of Therapeutics*, pages 563 (1941): "For acute attacks of 'bronchial asthma' the nitrites are considerably less effective than epinephrine, or theophylline, but nevertheless, they are occasionally used." They also state regarding the nitrites, "that morphine, theophylline, digitalis and other measures are paramount in the treatment of 'acute pulmonary edema' secondary to left ventricular failure."

Certain forms of dyspnoea yield only to opiates, particularly dyspnoea of left ventricular failure and pulmonary edema.

The following prescription in pill form is sometimes useful in chronic asthma: Sodium iodide grs. 1, Potassium bromide grs. 1, Nitroglycerin grs. 1/300, Tr. Lobelia Min. II, one pill, one to four times daily.

Hyperpiesia (Hypertension): Abnormally high pressure, as of the blood (blood pressure) is referred to by either of these names. The compounds of the organic nitrite group, such as erythrityl tetra-nitrate, nitroglycerin, manitol hexanitrate, etc., are important in the symptomatic treatment of hypertension. The most important action of these drugs is to dilate the small blood vessels. They exert no direct effect on the myocardium.

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Studies on Cotton Seed Feeding to Milch Animals.—By B. M. Patel and S. C. Ray. *Ind. J. Dairy Sci.*, Vol. 1, Nos. 1 & 2.

Investigations have been carried out to study the effect of equivalent replacement of a dairy mixture (containing no cotton seed) by cotton seed alone. The results indicate that the sole feeding of cotton seed augments both milk and butter fat secretion. This augmentation, however, is temporary and lasts for six to eight weeks. The percentage increase over the control during the period was 3.2 and 8.0 for milk and butter fat respectively.

In another experiment it has been shown that in a cotton seed dietary, quantitative production of milk and butter fat is significantly reduced when the green fodder supplement is withdrawn. The production is

relatively more pronounced in animals secreting butter fat over 0.75 per day.

A Comparative Study of ten minutes Resazurin Test for the Rapid Examination of Milk.—By Gurbhagwant Singh, M. R. Laxman Rao and H. Laxminarayana. *Ind. J. Dairy Sci.* Vol. 1, Nos. 1 & 2.

The application of the Ten Minutes resazurin test for the rapid examination of market milk supplies in Bangalore has been studied using some 420 samples of milk obtained from different sources.

Taking reduction up to lilac stage as a criterion of satisfactory quality and reduction below pink as indicative of unsatisfactory quality the test was found useful in picking out milks with high counts and poor keeping properties. Some average samples were also passed by the test and the causes for the discrepancy have been discussed.

The other platform tests, viz. acidity, C.O.B. test, brom-cresol purple test and alizarin-alcohol tests were not found to give reliable results. The usefulness of the indicator tests for obtaining supplementary evidence regarding the quality of milk has been suggested.

Phosphatase in Milk.—A. Kannan and K. P. Basu. *I. J. Dairy Sci.* Vol. 1, Nos. 1 & 2. For individual cows and buffaloes of the same breed, the phosphatase content of milk varies in a regular manner as the lactation advances, attaining a minimum value near about 4-15 days after parturition and then showing a continual increase thereafter as the lactation advances. There is very little variation of phosphatase content of goat milk while there is a sharp rise in the phosphatase content of sheep milk 15-20 days after parturition. Fluctuations in the phosphatase content of milk near about the date of service of the cow points out the influence of disturbed physiological conditions of the animals on the phosphatase content of milk.

Generally goats give milk of low phosphatase content while the phosphatase concentration of milk increases gradually from murrah buffaloes, Sindhi, cross-bred and Gir cows to sheep when the influence of lactation is given due consideration.

Composition of the Milk Fat of Various Species of Animals.—By Sadagopal. *Ind. J. of Dairy Sci.* Vol. 1, Nos. 1 & 2.

Milk fats from various species of animals were analysed for their chemical constants.

Milk fats from cow, buffalo, goat and sheep resemble each other as regards their general chemical characteristics including butyric acid contents.

While milk fats from cow and buffalo are similar as regards the nature and extent of steam-volatile fatty acids, the milk fats from goat and sheep differ significantly from the above in being richer in their steam-volatile water-insoluble fatty acid contents.

Milk fats from ass, camel and mare form one class in their composition and are characterised by the complete absence of butyric acid.

Milk fats from elephant and sow are classed as one group and their composition is quite distinct from other milk fats, being completely free from all steam volatile fatty acids.

Storage of Indigenous Butter.—By K. S. Rangappa and B. N. Banerjee. *Ind. J. Dairy Sci.* Vol. 1, Nos. 1 & 2.

Under village conditions, storage of *Desi* butter in buttermilk is better and acidity development is controlled. Under anaerobic conditions, also, the rate of acidity development is less. Storage of butter in dilute lactic acid solution however gives the longest keeping quality and produces the least acidity development as compared to the above methods.

The quality of ghee prepared from butter stored in lactic acid solution was found to be good as compared to the ghee prepared from butter stored either in dry condition or in water.

Rinderpest in History.—*True and concentrated. Excerpt from the Journal of the American Veterinary Medical Association* Vol. CXI, page 153, August 1947.

Rinderpest had been dogging eastern civilization since remote antiquity when the predecessors of the Germanic race (the conquering Goths) brought it out of Asia to eastern Europe as far west as the Danube in the second and third century of our era, whereupon the Huns under Attila scattered the cattle plague as far west as Chalon, France (451 A.D.) where they got a worse licking than did Adolph Hitler in 1945. After that historic lambasting, the well licked legions turned about face and took rinderpest to the Romans.

Everybody knows what happened for the next five centuries the Dark Ages, or the period of no Veterinary history at all. Cattle raising stood still, along with law and order and intelligence and culture. Squalor and poverty took over. By the ninth century rinderpest raged over all Europe—a gift of the Goths and the Huns. A studious historian tells of 200,000,000 cattle dead of rinderpest. The plague invaded Great Britain in the years 810, 1225, and 1714 (*Vet. Rec.* Nov. 16, 1946) and sneaked into Belgium for a spell in 1920 and into Argentine in 1921, only to be quickly exterminated.

Rinderpest led to the founding of veterinary colleges in the eighteenth century (1761), thanks for that. Since then rinderpest has struck nations in inverse ratio to the attention paid to veterinary education and service. *The difference between the backward East and progressive West is rinderpest.*—R. N. N.

Morphological Studies of the Blood of hill bulls in health and During acute Theileriasis*.—By B. M. Prasad, G.B.V.C., *Imperial Veterinary Research Institute, Mukteswar. Ind. J. Vet. Sc. Anim. Husbandry* Vol. XVI Part II June 1946 P. 54. The purpose of the present study was to obtain precise data on the total red-cell and white-cell counts, the differential white-cell counts and the haemoglobin content of the blood of Indian cattle in health and during acute theileriasis and thereby, if possible, to discover any factor involved in the biological behaviour of the causative agent that might be utilized for evolving a method of effective treatment.

Literature on the haematology of bovine blood is rather scanty and reference may be made to articles by Delaune [1940], Manresa and Reyes [1934], Sankarnarayan [1937] and Sen and Srinivasan [1937].

The only publication available specifically on a similar problem is that of Steck [1928] who studied the blood of cattle in South Africa in some detail during health and during theileriasis (East Coast fever). Summarizing the results of his studies on 13 animals, he states that with the onset of fever the leucocytes decrease in number progressively until death and that all the cells take part in this decrease. From the tables and charts illustrating Steck's paper it appears that from an average of about 13,000—15,000 leucocytes per c. mm. prior to infection, the count dropped in almost every case to an average of 500 per c. mm. In the differential white cell counts, a marked variation was noticed between the normal and clinical periods. The mean percentage of various types of cell, as recorded during the pre-infected state, is given as follows:—neutrophils 23 per cent, eosinophiles 4 per cent, lymphocytes 58 per cent, mononuclears 5 per cent. Occasionally, mast cells at 0.5 to 1 per cent were seen. Cases were studied during the incubation and clinical periods and although total leucocytes were markedly reduced, there was extensive lymphocytosis. From the onset of clinical symptoms, the increase in lymphocytes was noticed and this continued till death. The number of all other white-cells was reduced almost to *nil*, indicating that throughout the course of the disease the lymphocytes play a prominent part in the blood pathology of the condition. The changes described above were observed in almost all animals showing the typical clinical picture of East Coast fever, experimentally produced through infected ticks. The haemoglobin content was not estimated and although from the tables it appears that there was also a drop in the red-cell count the author does not mention this in his article.

* The causal agent of acute theileriasis in India is provisionally determined as *Taеileria annulata*.

MATERIAL AND METHODS

Seven hill bulls, three to seven years old, were used in the present investigation. These were housed together and given uniform ration. Six of them were inoculated in two lots with infected blood from artificially infected cases of theileriasis and one served as a control. To obtain the normal blood picture, counts were made from these animals for two days to a fortnight prior to infection, viz. eleven counts on four animals and three counts on two of them. Only four of the six bulls reacted but in none was the disease fatal.

For the red and white-cell counts, blood was collected from the jugular vein into tubes containing sodium citrate. To ascertain the accuracy of this method, blood was frequently drawn directly from the ear in the usual way into red and white potain pipettes.

For the red-cell count the blood was diluted 200 times in potain pipettes, using Toisson's fluid, and transferred to a Thoma (Hawksley) haemocytometer. In each case 100 squares were examined. The white blood corpuscles were counted in potain pipettes at dilution of 1:10, with 3 per cent acetic acid tinged with gentian violet.

For differential leucocyte counts, blood smears were prepared in the ordinary way from the ear vein and stained with Giemsa. Two methods were employed, viz., the Meander method, and counting many fields in one straight line from the beginning to the tail end of the smear. Immature cells of lymphoblastic and myeloblastic origin were differentiated by oxidase reaction in freshly prepared blood smears. For this purpose the method recommended by Piney [1931] was generally followed. Immediately after air-drying films were put in a glass-stoppered jar containing two per cent osmic acid and allowed to stand for 30 seconds for complete fixation. They were then washed thoroughly with distilled water and stained for 10 minutes with a mixture of equal parts of a 1 per cent solution of alphanaphthol and para-phenylenediamine. They were then washed in distilled water and mounted without drying on water glass, oxidase granules being stained blue. The absence of peroxidase granules together with sharper outlining of the nucleus differentiated the pathological lymphocytes from myeloblasts. The results obtained by the two methods were found to agree. Haemoglobin was estimated by the Sahli method.

OBSERVATIONS

During the sub-clinical period following the infective inoculation, there was a slight leucocytosis, all the cells taking part in the increase but with a slight tendency towards lymphocytosis. On an average, an increase of about 8 per cent was recorded.

From the onset of clinical symptoms, characterized by a sudden rise of temperature usually 13 or 14 days after giving the infected blood, leucocytes decreased, ultimately reaching a marked leucopenia persisting for two or three days during the post-clinical period or until recovery was under way. The average total white-cell count worked out at about 16,000 per c. mm. of blood; a drop to 3,400 and in one case to 1,840 is worthy of notice. But, although the number of leucocytes was appreciably reduced, there was a marked monocytosis at the expense of other cells. The mean percentage of the various types of cells, as shown by the differential counts made on the animals used in the investigation was as follows: lymphocytes 54 per cent, neutrophils 28 per cent, eosinophiles 6 per cent and mononuclears about 8 per cent. One bull showed a high percentage of eosinophiles which may have been due to helminthic infection. The average percentages, as shown during the period of full clinical manifestations, were as follows: lymphocytes 6 per cent, neutrophils 2 per cent, mononuclears 9.5 per cent and eosinophiles 0.5 per cent. These figures show a marked increase in monocytes and a relative decrease of lymphocytes, neutrophils and eosinophiles. Of the monocytes, a certain percentage appeared to be myeloblasts.

Karyorrhexis in the white corpuscles belonging to the hyaline series, as observed by Steck [1928] in the blood of animals with East Coast fever, was rarely encountered in the peripheral circulation suggesting that the accumulated cells do not undergo rapid destruction in the various organs.

There was also a slight decrease in the number of red blood corpuscles. From about six to eight millions per c. mm. prior to infection, a decline to four millions and in one case to three millions was observed. Thus a drop of 33 per cent to 50 per cent in red cells may occur when the disease has sufficiently advanced. No variation, however, took place during the sub-clinical period, but the decrease became manifest from the onset of clinical symptoms and, as in the case of the white corpuscles, persists until signs of recovery appear. It was also apparent that there is no appreciable drop in blood haemoglobin during the disease.

Healthy animals in good condition appear to be more resistant to the disease than those previously used for other work, e.g., on rinderpest. This observation emerges from the fact that of twelve animals discontinued from rinderpest experiments and inoculated with 20 c.c. of theileriasis blood ten succumbed to the disease, whereas, as already stated, the disease was not fatal in the six healthy hill bulls used in the present investigation after inoculation with equal quantities of blood obtained from the same control animals.

It has been observed by Sen and Srinivasan [1937] that the changes occurring in the blood of an affected animal following the appearance of schizonts in the peripheral blood afford a reliable clue to its chances of reco-

very. In all four reactors in the present investigation the first noticeable change in the blood was the occurrence of anisocytosis, dominated later by polychromatophilia and usually associated with basophilia, whilst it was not uncommon to find punctate degeneration of the nucleated red cells. It would appear that the sequence of anaemic changes is of a rapidly progressive type, since all the changes described above can be seen within a week or less from the beginning of anisocytosis. The restoration to normal of the blood picture is also rapid.

Samples of urine during the clinical and post-clinical periods were now and then examined for the presence of haemoglobinuria, but in no instance was any trace of haemoglobin found on chemical examination nor were intact erythrocytes seen microscopically.

Since in previously unused animals the disease was not fatal, the white-cell and differential counts up to the time of death were made on rinderpest discontinued animals, which to all appearances were in good condition and which were being used for maintaining the strain of theileria. In three good reactors, white cell counts were taken when the animals were *in extremis*. There was found to be considerable increase in the number of leucocytes, the count in one case being as high as 145,140 per c. mm. of blood. It would therefore appear that a condition of marked leucopenia which persists during the larger part of the clinical period, suddenly develops into one of marked leucocytosis. In the differential white-cell counts there was practically no variation from that recorded during the clinical period, except that a few more immature mononuclears were noticed.

The increase in the number of leucocytes in the peripheral blood immediately before death may be accounted for as follows. Numerous leucocytes were found to stagnate in the vascular system; apparently they stuck to the walls of the vessels, perhaps due to some alteration in the normal ionic charge of the blood elements and were thus prevented from leaving the organs by the veins. It may be that immediately or shortly before death, prevailing ionic conditions were disturbed and the leucocytes were no longer able to remain adherent to the vessel wall and hence were carried into the circulation.

SUMMARY

In experimental theileriasis slight leucocytosis was observed during the sub-clinical period, with increase in the number of lymphocytes, followed by a marked leucopenia. Differential white cell counts showed a marked relative monocytosis, indicating that monocytes play an important part in the blood pathology of theileriasis as met with in this country.

Somewhat voluminous tables showing the figures for blood counts are withheld for reasons of space but are available for scrutiny at Mukteswar.

There was no noteworthy reduction in haemoglobin values.

Animals in good condition were comparatively resistant to the disease.

The sequence of anaemic changes occurring in the blood of an infected animal afforded a fairly reliable indication as to its chances of recovery.

The morphological changes occurring in the blood do not afford a clue for evolving a method of effective treatment. Further study to find out the exact nature of the agents causing death is desirable.

ACKNOWLEDGEMENT

I am indebted to Dr. S. C. A. Datta for his interest and to Dr. F. C. Minett for correcting the paper for publication.

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Review

INDIAN JOURNAL OF DAIRY SCIENCE

We extend a hearty welcome to this well got-up periodical which is a quarterly organ of the Indian Dairy Science Association. As the Editor of the Journal in his 'declaration of purpose' states, the publication is the outcome of a long-felt desire on the part of all persons concerned with Dairy Science in India to find a satisfactory medium of expression to cover the large and growing developments in the science and practice of dairying in this country and to serve as a link between scientific workers engaged in different parts of the world.

This publication has appeared none too soon and we are quite sure it will fill a long-felt want in this country. Unlike other countries, Dairy Science has been a very much neglected subject here, and it is only very recently that some attention is being bestowed on the subject. It is necessary that this interest is fostered and nourished properly and the sure way of doing this is by publications of this kind. Judging from the articles in this first issue, we are assured of a good and varied fare in all aspects of Dairy Science.

Veterinarians of the present day should attach great importance to this aspect of their profession and subjects like those found in this issue, for example, the effect of feeding cotton seed to milch animals, variation in the Phosphatase content of milk in Indian milch animals, the composition of the Milk Fat of various species of animals should prove of great interest to them.

We wish the Journal every success.

ERRATA

Vol. XXIV, No. 6 (May 1948).

Page 411, 2nd para, 2nd line, for 'effected' please read 'affected.'

" " 3rd line; for 'wtih', please read 'with'

" " 3rd line, for 'cases', read 'case.'

Vol. XXV, No. 1 (July 1948).

Page 36, 3rd para, 2nd line, for 'general', please read 'genera.'

Vol. XXV, No. 2 (Sept. 1948).

Page 72, 2nd para from bottom, 1st line for 'education early', read 'early education'.

Page 77, 5th line from bottom, for 'had noticed' read 'was noticed'.

Page 81, 7th line from top, for 'Castration of a Bar' read 'Castration of a Bear'.



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